SAMSUNG Electronics

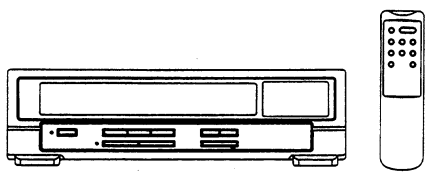
VHS PAL

SERVICE MANUAL

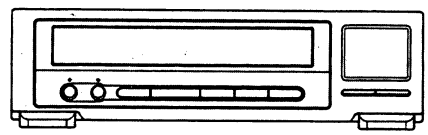
SVM-PX-001-1E
68139 - 242 - 001

MODEL : PX-990R/991R/ 992R/VPX-43R

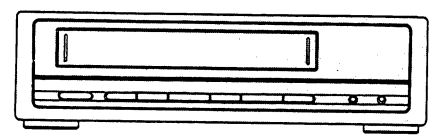
VIDEO CASSETTE PLAYER



PX-990/990R/VPX-43R



PX-991/991R



PX-992/992R

SPECIFICATION

Format :	VHS PAL standard
Television System :	CCIR Standard System
Color System :	PAL, MESECAM
Audio Track :	1 track
Tape Width :	12.7 mm (1/2 inch)
Tape Speed	
SP :	23.39 mm/s (0.92 inch/s)
Playback Time :	180 min. With E-180 used in SP mode
FF/REW Time:	Less than 5 min. With E-120
Heads :	Video : 2 rotary heads (Helical scanning system) Audio/Control : 1 Stationary head
VIDEO	
Output :	VIDEO OUT jack (RCA) 1.0Vp-p 75 ohm unblanced
Signal-to-Noise Ratio :	better than 40dB
Horizontal Resolution :	more than 220 lines
AUDIO	
Output :	AUDIO OUT jack (RCA) -6dBm, 600 ohm unbalanced
Signal-to-Noise Ratio	
SP :	better than 40dB
Frequency Response	
SP :	100Hz - 7KHz
RF Modulated :	Channel 32 - 40 (Preset CH36)
Power Requirement :	AC : 220V/50Hz, DC : 12V
Power Consumption :	Approx. 17 Watts
Operatin Temperature :	41 °F - 104 °F (5 °C - 40 °C)
Operating Humidity :	10% - 75%
Weight (net) :	4.5Kg
Dimensions (net) :	80 (H) x 300 (W) x 337 (D) mm

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1. GENERAL DESCRIPTION

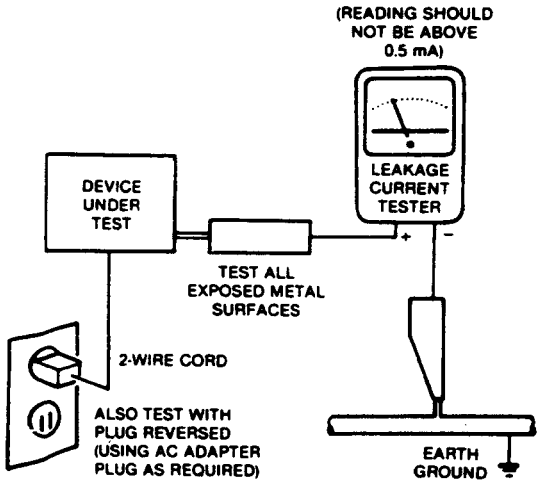
1-1. SAFETY PRECAUTIONS

1. Before returning a Video Cassette Recorder to the customer, always make a safety check of the entire instrument, including, but not limited to the following items:

a. Be sure that no built-in protective devices are defective and/or have been defeated during servicing.
(1) Protective shields are provided on this chassis to protect both the technician and the customer. Correctly replace all missing protective shields, including any removed for servicing convenience.
(2) When reassembling the instrument, be sure to put back in place all protective devices, including, but not limited to nonmetallic control knobs, insulating fish papers, adjustment and compartment covers/shields, and isolation resistor/capacitor networks.
Do not operate this instrument or permit it to be operated without all protective devices correctly installed and functioning.

b. Be sure that there are no cabinet openings through which an adult or chield might be able to insert their fingers and contract a hazardous voltage. Such openings include, but are not limited to,
(1) excessively wide cabinet ventilation slots, and (2) improperly fitted and/or incorrectly secured cabinet covers.

c. **Antenna Cold Check**-With the instrument AC plug removed from any AC source, connect an electrical jumper across the two AC plug prongs. Place the instrument AC switch in the on position.
Connect one lead of an ohmmeter to the AC plug prongs tied together and touch the other ohmmeter lead in turn to each tuner antenna input exposed terminal screw and, to each of the coaxial connectors.



AC Leakage Test

If the measured resistance is less than 1.0 megaohm or greater than 5.2 megaohm, an abnormality exists that must be corrected before the instrument is returned to the customer.
Repeat this test with the instrument AC switch in the off position.

d. **Leakage Current Hot Check**-With the instrument completely reassembled plug the AC line cord directly into a 220 (240V-UK) AC outlet. (Do not use an isolation transformer during this test). Use a leakage current tester or a metering system that complies with American National Standards Institute (ANSI) C101.1 ***Leakage Current for Appliances*** and Underwriters Laboratories (UL) 1410, (50. 7). With the instrument AC switch forst in the on position and then in the off position, Measure from a known earth ground (metal waterpipe, conduit, etc) to all exposed metal parts of the instrument (antennas, handle bracket, metal cabinet, screwheads, metallic overlay, controls shafts, etc), especially any exposed metal parts that ofter an electrical return path to the chassis. Any current measured must not exceed 0.5 milliamp. Reverse the instrument power cord plug in the outlet and repeat test.

ANY MEASUREMENT NOT WITHIN THE LIMITS SPECIFIED HEREIN INDICATE A POTENTIAL SHOCK HAZARD THAT MUST BE ELIMINATED BEFORE RETURNING THE INSTRUMENT TO THE CUSTOMER OR CONNECTING ANTENNA OR ACCESSORIES.

e. **AC Leakage Test**
Avoid shock hazards. The television instrument, accessory, or cables (s) to which this VCP is connected should have the applicable sections of the antenna cold check and the leakage current hot check performed. Do not connect this VCP to a TV antenna, cable or accessory that exhibits excessive leakage currents.

2. Read and comply with all caution and safety related notes on or inside the VCP cabinet and chassis.

3. **Design Alteration Warning**-Do not alter or add to the mechanical or electrical design of this Video Cassette Recorder. Design alterations and additions, including, but not limited to circuit modifications and the addition of items such as auxiliary audio and/or video output connections, might alter the safety characteristics of this instrument and create a hazard to the user. Any design alterations or additions may void the manufacturer's warranty and may make you,the servicer responsible for personal injury or properly damage resulting therefrom.

4. Observe original lead dress. Take extra care to assure correct lead dress in the following areas: a. near sharp edges, b. near thermally hot parts-be sure that leads and components do not touch thermally hot parts, c. the AC supply, and d. antenna wiring. Alway inspect in all areas for pichced, out-of-place, or frayed wiring. Do not change spacing between components, and between components and the printed circuit board. Check AC power cord for damage.

5. Components, parts and/or wiring that appear to have overheated or are otherwise damaged should be replaced with components, parts, or wiring that meet original specifications, Additrionally, determine the cause of overheaing and/or damage and, if necessary, take of corrective action to remove any potential safety hazard.

6. Product Safety Notice
Some electrical and mechanical parts have special safety related characteristics which are ofter not evident from visual inspection, nor can the protection they give necessarily be obtained by replacing them with components rated for higher voltage,wattage etc. Parts that have special safety characteristics are identified by a (*) or (⚠) on schematics and parts list. Use of a substitute replacement that does not have the same safety characteristics as the recommended replacement part might create shock, fire, and/or other hazards.
Products safety is under review continuously and new instructions are issued whenever appropriate.

Electrostatically Sensitive (ES) devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called *Electrostatically Sensitive (ES) Devices*. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques shold be used to help reduce the incidence of component damage caused by static electricit

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially availabel discharging wrist strap device, which should be removed for potential shock reasons prior to appling power to the unit under test

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material.)

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
CAUTION : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

SPECIAL NOTE
All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "electrostatically sensitive (ES) devices" section of this service manual.

IMPORTANT SAFETY NOTICES
Components identified with the mark ⚠ have the special characteristics for safety when replacing any of these components. Use only the same type.

1-2. GENERAL INFORMATION

*** Operation Modes**

Play, still and noise cancel, forward search and JET forward search, reverse search and JET reverse search, fast forward and rewind, V-Lock, auto repeat and shut off operations are possible. Two video head system uses tow video heads on the upper drum. Two video heads (CH-1/CH-2 : +70um/-90um) are used during playback at SP mode.

*** Automatic power on**
The VCR will automatically turn power on when you insert a cassette without pushing power button.

*** Automatic playback**
When you insert a cassette, the VCR will turn power on and playback automatically without pushing power and play button. If you want to go to "REW or FF" mode directly after inserting the cassette, you must do a STOP-REW (FF) in sequence.

*** Automatic Rewind**
The VCR automatically rewinds the tape when the tape is reached to the end.

*** Search (JET)**
If you push FF/REW button twice for "reverse picture search" or "forward picture search" picture search in performed 9 times as fast as normal speed.

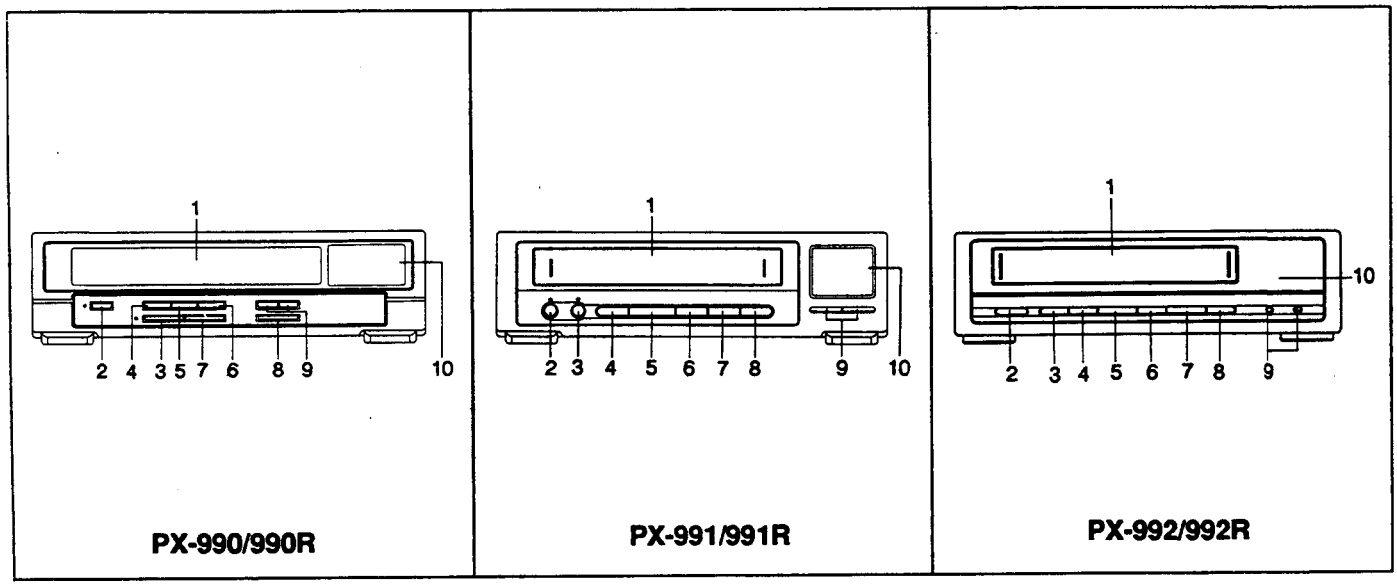
*** V-Lock (REMOCON OPTION)**
This function adjusts vertical shaking of TV screen by Remote Control.

*** Tracking (UP/DOWN)**
This button is to be used to eliminate streaks (Noise bar) from the picture during playback and search mode. (Normally auto tracking is performed)

*** Quick start**
This is to shorten the switching time from stop mode to play mode by Full Loading Deck.

1-3. OPERATING FUNCTION AND CONTROLS

1-3-1. FRONT VIEW



PX-990/990R | PX-991/991R | PX-992/992R

1. VIDEO CASSETTE COMPARTMENT
Push the cassette gently into the compartment until you feel automatic pull. Then, power turnes on automatically and VCR goes to "PLAY MODE".

2. ON/STANDBY Button
Push this button to turn power ON or STANDBY.

3. STOP/EJECT Button
Push to stop the tape during playback, rewind , fast-forward forward or reverse picture search,and push this button to remove the cassette tape from the set in stop mode.

4. REW(Rewind/Reverse Picture search/JET-RPS) Button
Push this button to rewind the tape. Push for reverse picture search during playback. Push for high speed reverse picture search during the reverse picture search. When the picture reaches the point you are looking for, push the PLAY button to resume normal playback.

5. PLAY Button
Push this button to playback a recorded tape.

6. FF (Fast Forward/Forward Picture Search/ JET-FPS) Button
Push to move the tape forward rapidly.
Push for forward picture search during playback. Push for high speed forward picture search during the forward picture search. When the picture reaches the point you are looking for, push the PLAY button to resume normal playback.

7. STILL/NOISE CANCEL Button
Push this button to stop the tape temporarily durin playback,and push this button repeatedily to clear the noise bar in still mode.

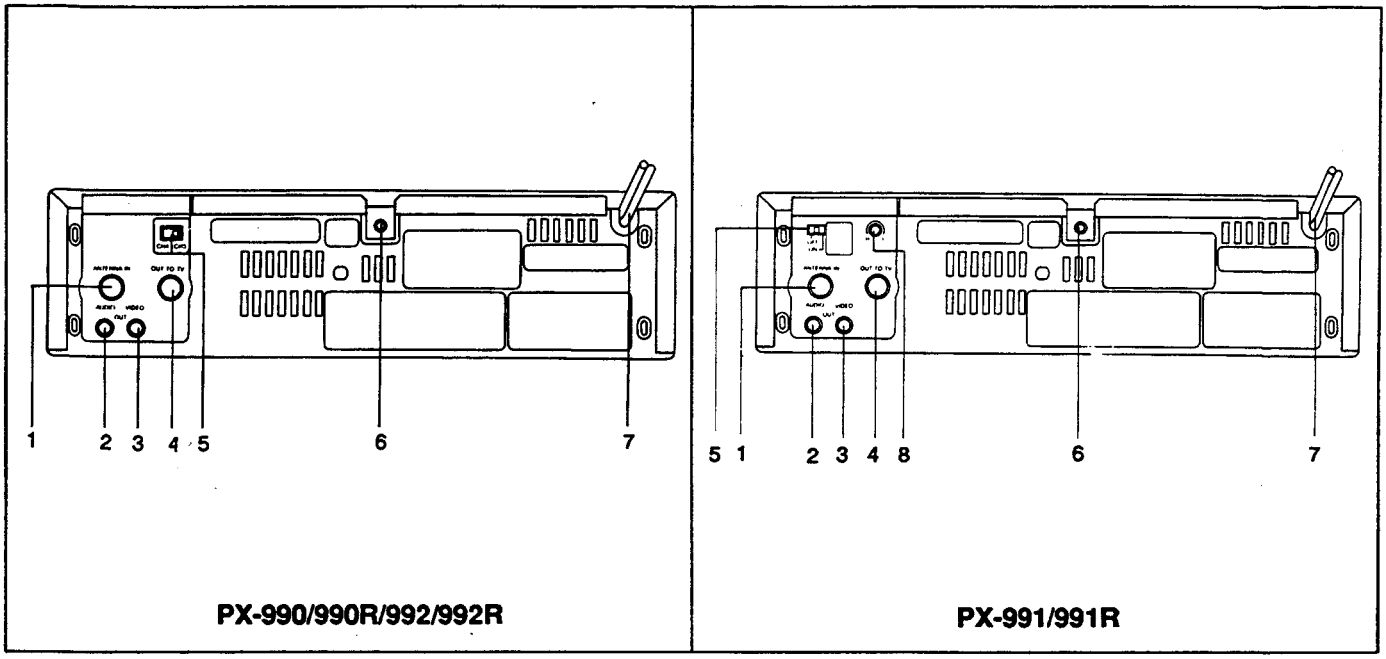
8. AUTO REPEAT/SHUT OFF Button
You can experience AUTO REPEAT PLAY or AUTO SHUT OFF after rewind with this button. The unit will do auto repeat play when the AUTO REPEAT LED lights by pressing button. The unit will do auto shut off when the AUTO REPEAT LED goes out by pressing button.

9. TRACKING DOWN or UP Buttons (▼ , ▲)
Press these buttons to remove noise bar in playback mode.

10. INDICATOR (OPTION)

NOTE :
If you want to go to "FF (REW)" mode directly after inserting the tape, you must do a "STOP-FF (REW)" sequence.

1-3-2. REAR VIEW



PX-990/990R/992/992R

PX-991/991R

1. ANTENNA IN
Connect external antenna.

2. AUDIO OUT
Permits audio connection of your unit to a monitor or another VCR.

3. VIDEO OUT
Permits video connection of your unit to a monitor or another VCR.

4. RF OUT
Connect to TV antenna (aerial) input.

5. CHANNEL OUTPUT SELECTOR (PX-990/990R/992/992R)
Switch to CH 3 or 4, whichever is not used in you area. To view tapes in "PLAYBACK MODE" and to use your TV as a monitor.

5. TEST ON/OFF (PX-991/991R)
Turn this switch ON and check that video channel of your TV set is correct.
After setting, set this switch to OFF.

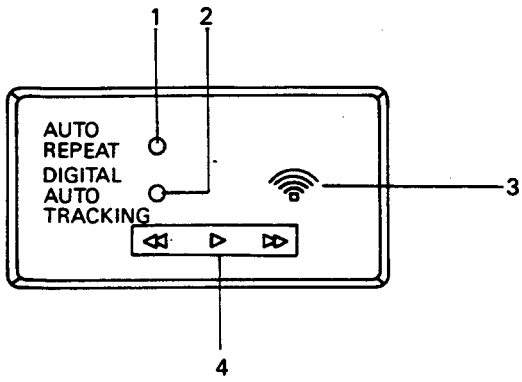
6. DC POWER JACK
Permits power source connection of your unit to a DC battery or car battery.

7. ELECTRICAL (POWER) CORD

8. RF CHANNEL PRE-SET (PX-991/991R ONLY)
In some areas the pre-set RF output of your video cassette player may clash with a TV broadcast. If this occurs rotate this control using a small screwdriver clockwise or counter-clockwise. A new video channel has now been set and you will need to retune your television video channel to the new RF output.

CAUTION :
After providing DC power source (12V), if DC power source level of a DC battery or car battery drop, noise bar may be flowed in FF/REW picture search mode.

1-3-3. INDICATOR



1. AUTO REPEAT/SHUT OFF INDICATOR
Auto repeat led turns on in auto repeat play mode.

2. TRACKING INDICATOR
Digital auto tracking led turns on in auto tracking mode.

3. INFRARED REMOTE SENSOR
Receives infrared signal from remote control.

4. DETAILED OPERATING CONTROLS

*** PLAY (▶)**
This LED turns on in PLAY mode.

*** REW (◀◀)**
This LED turns on in REW mode.

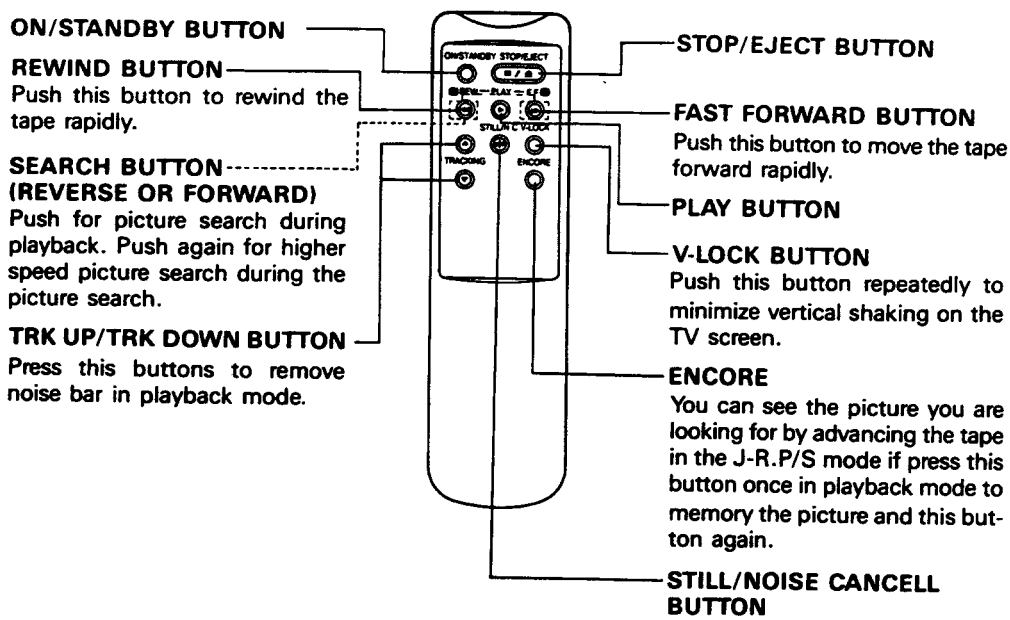
*** REVERSE PICTURE SEARCH/JET-RPS (◀◀ , ▶)**
This LED turns on in FPS or JET-FPS mode.

*** FF (▶▶)**
This LED turns on in FF mode.

*** FORWARD PICTURE SEARCH/JET-FPS (▶ , ▶▶)**
These LED turns on in FPS or JET-FPS mode.

*** STILL/NOISE CANCEL (▶)**
This LED blinks in STILL mode

1-2-4. REMOTE CONTROL



1-4. CLEANING AND LUBRICATION

1-4-1. CLEANING TAPE MECHANISM

Periodic cleaning is necessary to insure continued excellent performance of the tape mechanism. To clean the following parts, patch and solvent are available.

1. Capstan shaft.
2. All idler wheels.
3. All tape guide posts.
4. Supply and take-up reels.
5. Pinch roller.
6. Capstan belt.
7. Capstan motor pulley.

To clean video heads, full erase head, and audio/control (A/C) head, use only head cleaning kit and solvent.

Note : When cleaning video heads, move the cleaning stick in the direction of head rotation. Wiping in a vertical direction may damage the heads.

1-4-2. LUBRICATION TAPE MECHANISM

The tape transport mechanism is properly lubricated at the factory. In normal use cycles, and with average environmental conditions, additional lubrication should not be required. When relubricating, remove old lubricant

first, then sparingly apply new lubricant.
(Excessive lubricant may be transferred to other assemblies causing malfunction).

Use grease on the following parts every 1,000 hours of operations. (See exploded view for location)

1. Between base pole assembly (L,R) and main base.
2. Pinch roller base cam.
3. Gear master cam.
4. Gear E/J drive.
5. Gear L/D "L,R".
6. Base pole edge.
7. Slide main brake.
8. Bracket E/J drive.
9. Sector gear.

Oil may be required for the following parts after 1,000 hours of operation.(See exploded view for location).

Main base
1. Arm tension mould.
2. Shaft reel disk "L,R" mould.
3. Shaft gear worm wheel.

Other parts which are not listed above do not be required lubrication, except when parts are replaced. Use appropriate oil or grease as indicated on exploded view.

1-5. ABBREVIATIONS

2X : Double
4.43MHz : Color Sub Carrier

ACC : Automatic Color Circuit
ACK : Automatic Color Killer
ADD : Adder
AFC : Automatic Frequency Control
AFT : Automatic Fine Tuning
AGC : Automatic Gain Control
AL : Always
ALC : Automatic Level Control
AMP : Amplifier
APC : Automatic Phase Control
AUX : Auxiliary

BATT : Battery
BD : Burst Deemphasis
BE : Burst Emphasis
BH : Power Supply for Selecting VHF High Band
BL : Power Supply for Selecting VHF Low Band
BPF : Band Pass Filter

C.FG : Capstan Frequency Generator
C.SYNC : Composite Sync
CAFC : Capstan Auto Frequency Control
CAPC : Capstan Auto Phase Control
CATV : Cable TV
CAR : Carrier
CAP : Capstan
CCD : Charge Coupled Device
CH : Channel
CHAR. : Character
CHROMA : Chrominance
CM : Capstan Motor
COMP : Comparator
CST : Cassette
C-ERR : Capstan Error
CTL : Control
C.PG : Capstan Pulse Generator
CUR.EMPH : Current Emphasis

D.FG : Drum Frequency Generator
D.O.C : Drop Out Compensator
D.PG : Drum Pulse Generator
D/A : Digital-to-Analog
D/C : Dark/Clip
D.AFC : Drum Auto Frequency Control
D.APC : Drum Auto Phase Control

DE-EMPH : De-Emphasis
DET : Detector
DEV : Deviation
DLYD : Delayed
DM : Drum Motor
DEMOD : Demodulator
D.D : Direct Drive

E-E : Electronic-to Electoronic
EMPH : Emphasis
ENV : Envelope
EQ : Equalizer

F.ADV : Frame Advance
F-V : Frequency to Voltage Coverter
F.FWD : Fast Forward
FH : Frequency Horizontal
FG : Frequency Generator
FM : Frequency Modulator
FSC : Frequency Sub Carrier
FWD : Forward
FC : Frequency Center
FL : Frequency Low

GEN : Generator
GND : Gorund

HPF : High Pass Filter

IF : Intermediate Frequency
IR : Infrared Receiver

LED : Ligh Emitting Diode
LIM : Limiter
LPF : Low Pass Filter
LUMA : Luminance
LCD : Liquid Crystal Display
LNR : Linear

MIX : Mixer
MM : Monostable Multivibrator
MTS : Multi Sound Television System
MEM : Memory

N.C : No Connection
NORM : Normal

OSC : Oscillator
OTR : One Touch Recording
OSP : On Screen Programme
OSD : On Screen Display

PB : Play Back
P.C : Power Control
PG : Pulse Generator
PIF : Picture Intermediate Frequency
PLL : Phase Lock Loop
PRG : Programme

PWM : Pulse Width Modulation
PWR : Power
P/S : Pause/Still
PD : Power Detector

REG : Regulator
REC : Record
REC.SAF : Record Safety
REW : Rewind
RF : Radio Frequency
REV : Revers
RECT : Rectifier
REF : Reference

SC : Simul-Cast
SC : Sub-Carrier
SCK : Shift Clock
SDA : Serial Data
SIF : Sound Intermediate Frequency
SP : Standard Play
SW25Hz : Head Switching Pulse
SYNC : Synchronizing Signal
SYSCON : System Control
STB : Strobe
SI : Serial Input
SO : Serial Output
SW : Switch

TP : Test Point
TRK : Tracking

UL : Unloading

VT : Tuning Voltage
VP : Vertical Lock pulse
V-REF : Voltage Reference
V-SYNC : Vertical Sync
VCO : Voltage Controlled Oscillator
VCR : Video Cassette Recorder
VIF : Video Intermediate Frequency
VPS : Video Programming System
VHS : Video Home System
VXO : Voltage Controlled Crystal Oscillator
VSS : Voltage Super Source
VISS : VHS Index Search System

W/C : White /Clip
W/D : White/Dark

Y : Luminance

uP : Microprocessor

2. DISASSEMBLY

2-1. INSTRUMENT DISASSEMBLY

2-1-1. Top Cabinet Removal

1) Remove four (4) screws located at both sodes of the top cabinet.
2) Carefully lift the top cabinet and slide it to the rear to remove.

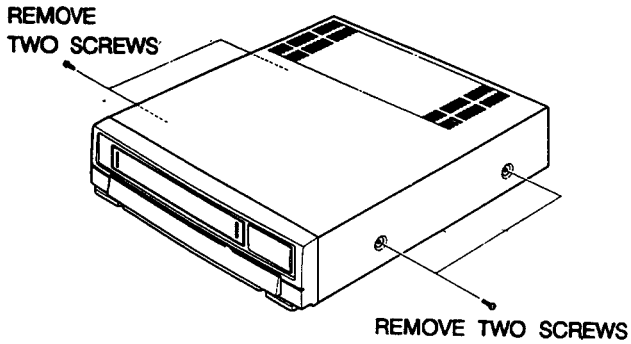


Fig.1 Top Cabinet Removal

2-1-2. Front Panel Removal

1) Remove the top cabinet (Fig. 1).
2) Release seven (7) tabs from the bottom, top and both sides of the front panel.
3) Tilt the front panel forward to remve.

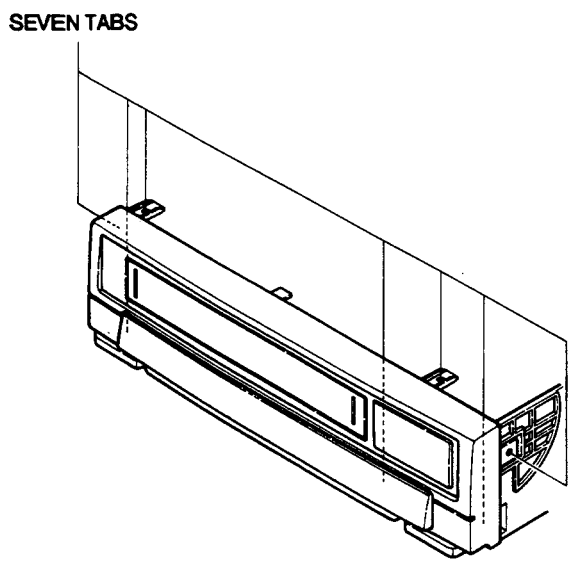


Fig. 2 Front Panel Remova

2-1-3. Bottom Cover Removal

1) Push the bottom cover toward arrow and remove it.

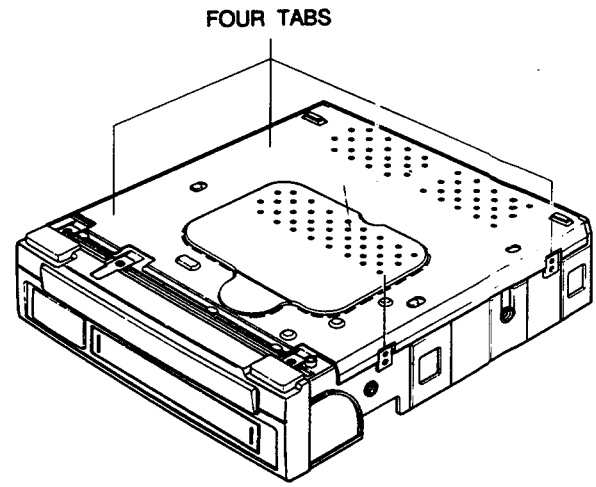


Fig. 3 Bottom Cover Removal

2-1-4. Main A Circuit Board Removal

1) Follow the procedure for removing top cabinet (Fig. 1).
2) Remove three (3) screws from the frame.
3) Remove bracket syscon and disconnect two (2) connectors (CN301,CN302) which connect main A and function board.
4) Lift the main A PCB toward the arrow to remove.

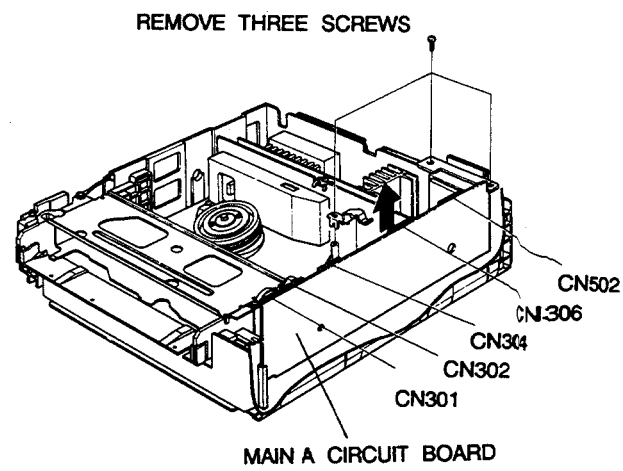


Fig. 4 Main A Circuit Board Removal

2-1-5. Main B Circuit Board Removal

1) Follow the procedure for removing top cabinet (Fig. 1).
2) Remove one (1) screw from the frame and lift up the bracket.
3) Disconnect one (1) connector (CN401) from the Main B circuit board and disconnect one (1) connect (CN502) from the Main A circuit board.
4) Lift the PCB toward arrow to remove.

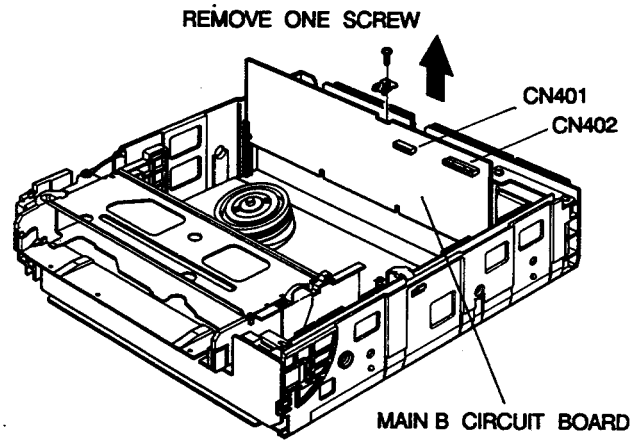


Fig. 5 Main B Circuit Board Removal

2-1-6. Function Circuit Board Removal

1) Follow the procedures for removing the top cabinet (Fig. 1), front panel (Fig. 3).
2) Disconnect two (2) lead connectors (CN601, CN602) from the main A circuit board.
3) Release five (5) tabs on the function circuit board.

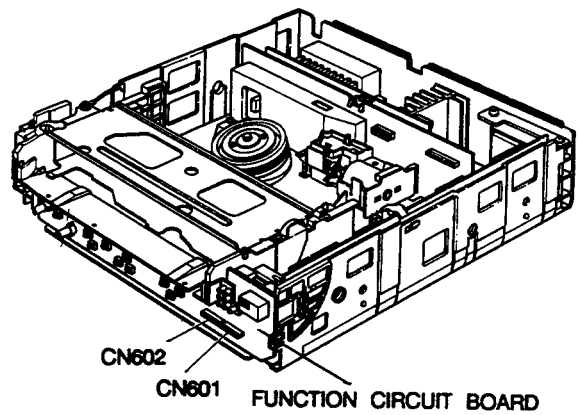


Fig. 6 Function Circuit Board Removal

2-1-7. Pre-Amp Circuit Board Removal

1) Follow the procedure for removing the top cabinet (Fig. 1).
2) Remove two (2) screws holding the Pre-Amp to the frame.
3) Disconnect two (2) connectors on the Pre-Amp circuit board,
4) pull out the Pre-Amp ass'y in the direcion of the arrow and then release shield cases.

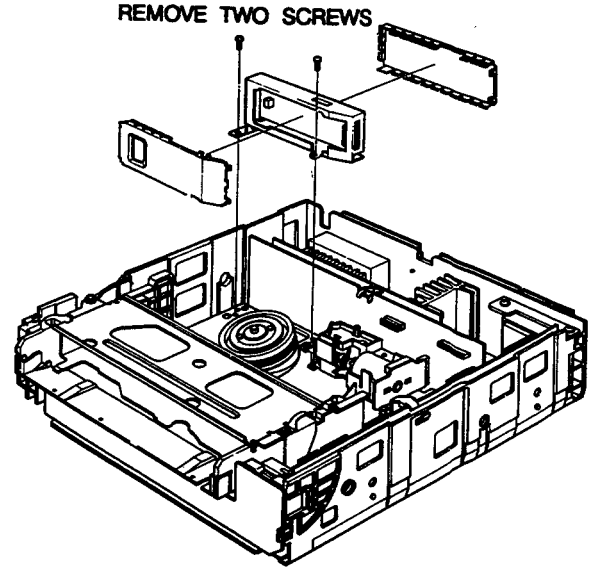


Fig. 7 Pre-Amp Circuit Removal

2-1-8. Regulator Assembly Removal

1) Follow the procedure for remving the top cabinet (Fig. 1).
2) Remove one (1) screw securing the regulator ass'y.
3) Disconnect two (2) connectors (CN101, CN102) on the regulator circuit board.
4) Release one (1) tab while pushing the regulator ass'y toward A and then lift the regulator ass'y toward B.

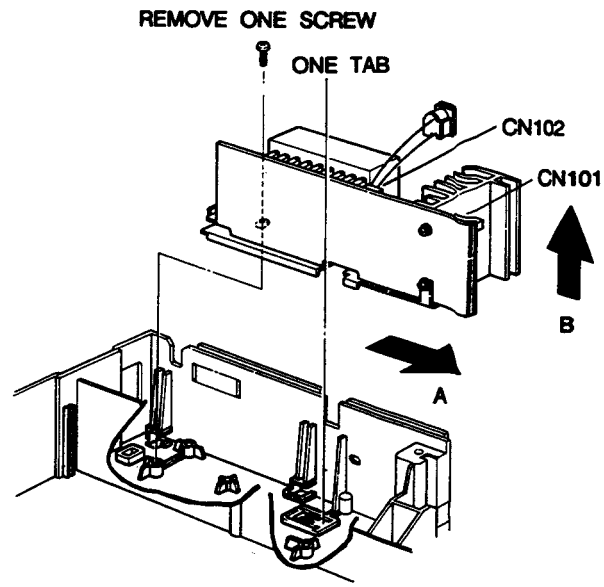


Fig. 8 Regulator Circuit Board Removal

2-2. MECHANICAL DISASSEMBLY

Tape Transport Mechanism Identification

(Top Side)

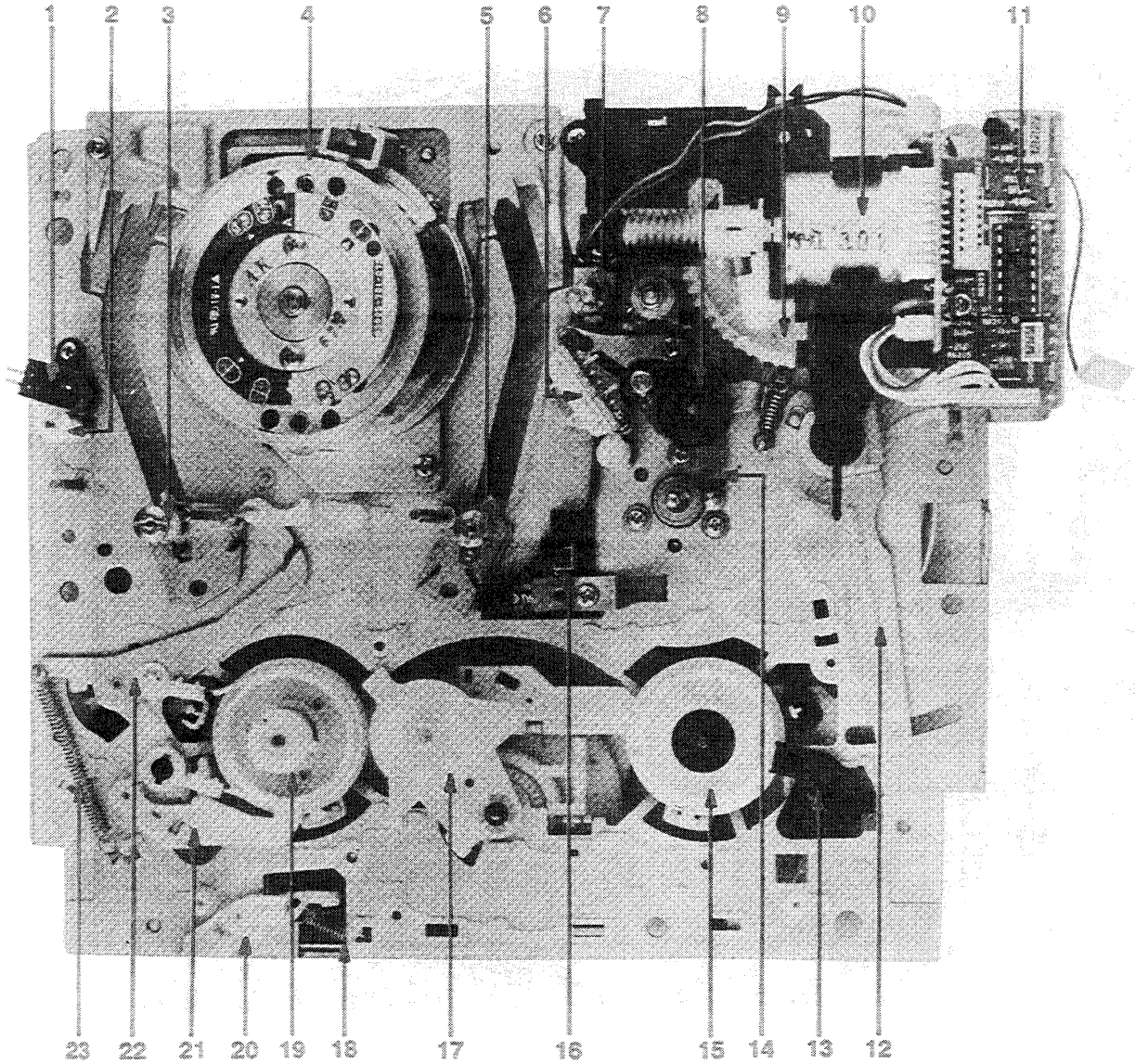


Fig. 9 Tape Transport Mechanism-Top View

1. DUMMY HEAD
2. SUPPLY ROLLER
3. POLE BASE "L" ASS'Y
4. CYLINDER ASS'Y
5. POLE BASE "R" ASS'Y
6. A/C HEAD ASS'Y
7. CAM ADJUST
8. PINCH ROLLER LEVER ASS'Y
9. MASTER CAM GEAR
10. L/D UNIT ASS'Y
11. P.C.B JOINT ASS'Y
12. BRAKE LEVER CAM ASS'Y
13. SUB BRAKE "R"
14. REVIEW DISK (R)
15. REEL DISK (R)
16. LED ASS'Y
17. SUB IDLER ASS'Y
18. REC S/W SPRING
19. REEL DISK (L)
20. REC S/W LEVER
21. SUB BRAKE "L"
22. TENSION ARM ASS'Y
23. TENSION SPRING

* Item 18, 20 are exclusive in PB ONLY model.

(Bottom Side)

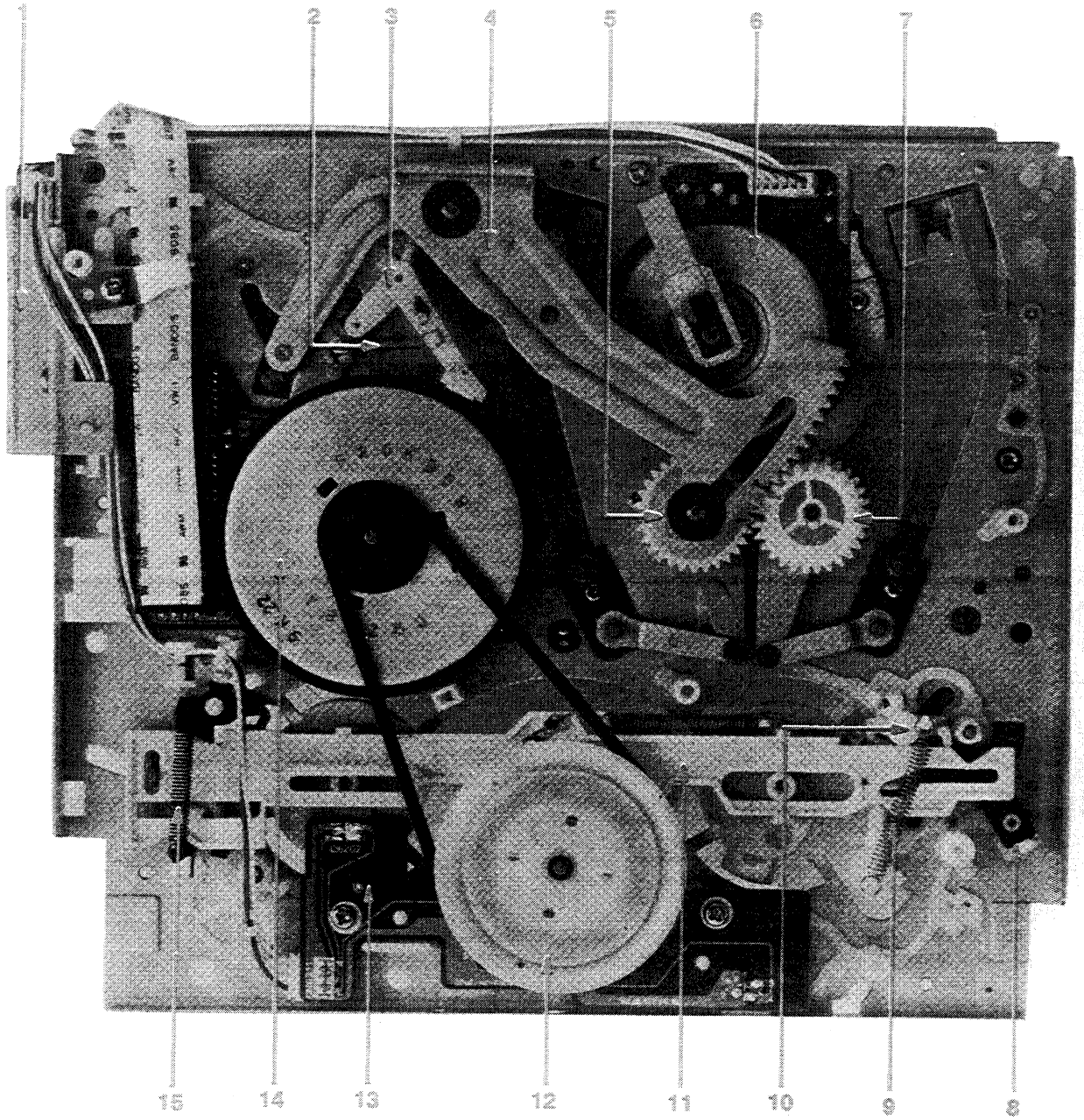


Fig. 10 Tape Transport Mechanism-Bottom View

1. EJECT DRIVE BRACKET
2. D.D CAPSTAN BRAKE SPRING
3. D.D CAPSTAN BRAKE
4. SECTOR GEAR ASS'Y
5. LOADING GEAR "R" ASS'Y
6. CYLINDER MOTOR
7. LOADING GEAR "L" ASS'Y
8. TENSION CONTROL LEVER
9. SUB SPRING "L"
10. MAIN BRAKE "L"
11. MAIN BRAKE SLIDE ASS'Y
12. CLUTCH ASS'Y
13. REEL P.C.B ASS'Y
14. D.D CAPSTAN MOTOR
15. SUB SPRING "R"

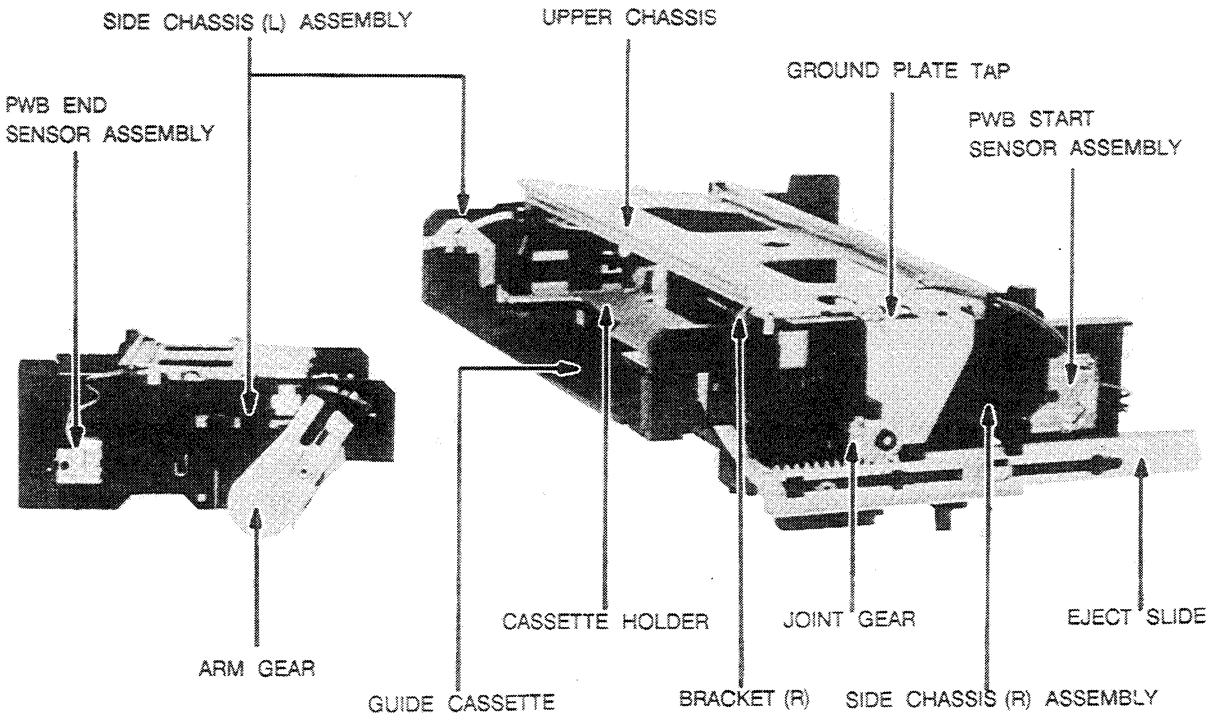


Fig. 11 F/L Housing Assembly Identification

2-2-1. Housing Assembly Removal

1. Follow the procedure for removing the cover (See Figs 1 to 3).
2. Disconnect the housing sensor connector from the PWB Deck Joint.
3. Remove two (2) screws holding the housing assembly and the Main Base.
4. Push the housing assembly in the direction of arrow A and then lift up in the direction of arrow B.

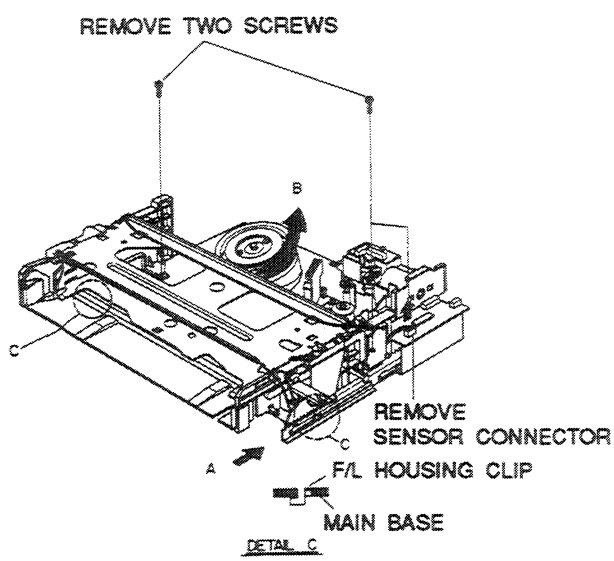


Fig. 12 Housing Assembly Removal

2-2-2. PWB Sensor (S) Assembly Removal

1. Push the wire toward A,B arrows and then remove it.
2. Push apart clips as shown in C direction and remove P.C.B.

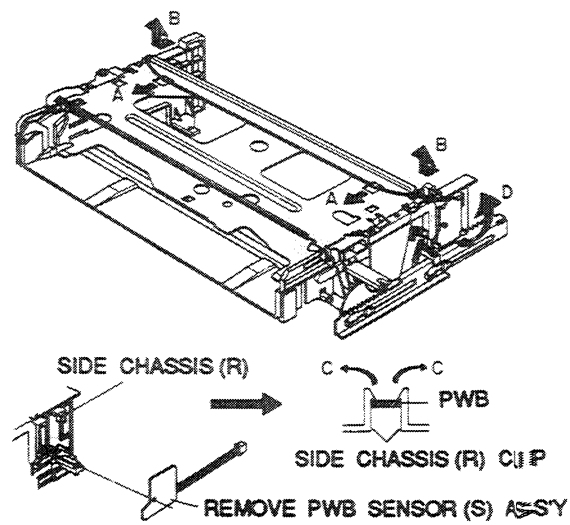


Fig. 13 PWB Sensor (S) Assembly Removal

2-2-3. PWB Sensor (E) Assembly Removal

1. Push apart clips as show in direction A and remove P.C.B in direction C.

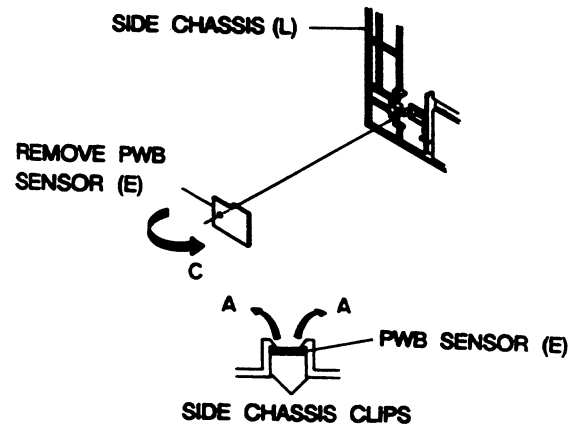


Fig. 14 PWB Sensor (E) Assembly Removal

2-2-4. Sub Assembly Removal

1. Remove two (2) screws holding the upper chassis and remove the ground plate top.
2. Lift the upper chassis toward A.
3. Lift the assembly cassette holder toward E.
4. Push the eject slide toward E to the end, lift it in the direction of arrow C.
5. Release clip on right side of chassis in direction D and remove the Joint Gear.

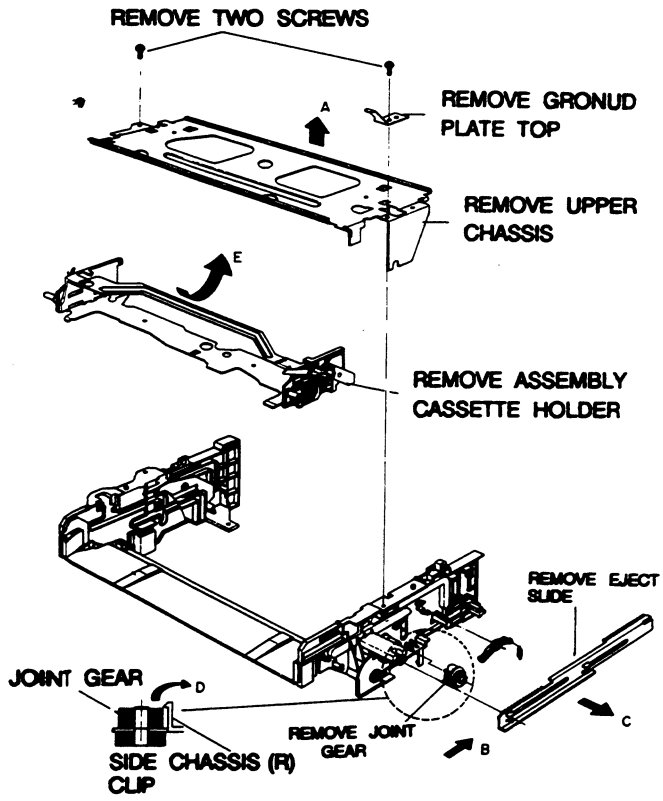


Fig. 15 Sub Assembly Removal

2-2-5. Side Arm Assembly Removal

1. Release the clip as shown in A.
2. Lift chassis right as shown in C.
3. Release the clip as shown in D.
4. Release the clip on left chassis, same as in step 2.
5. Remove left side chassis as shown in F.

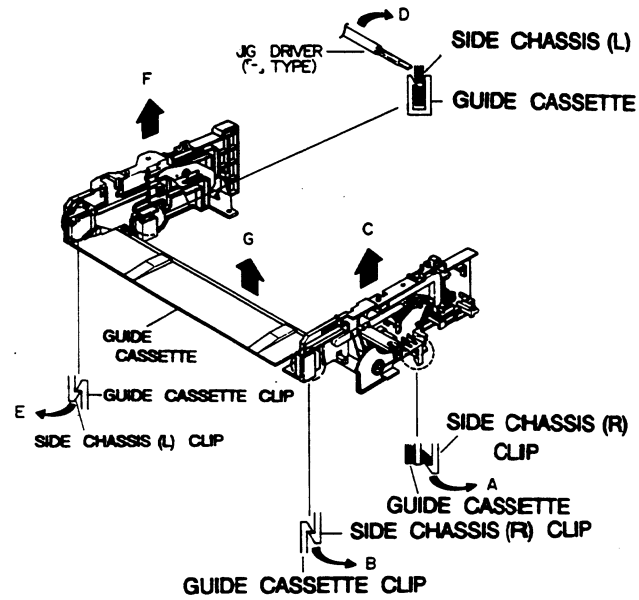


Fig. 16 Side Arm Assembly Removal

2-2-6. Arm Gear Removal

1. Remove eject spring by prying out center.
2. Remove spring tension arm (R) from the hook of side arm (R).
3. Remove the arm gear.

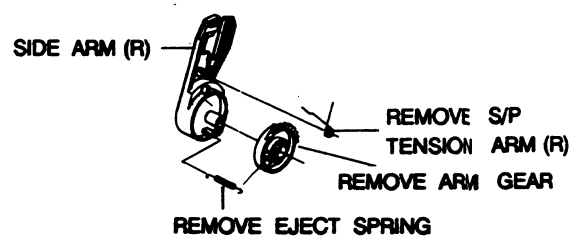


Fig. 17 Arm Gear Removal

2-2-7. Cassette Holder Assembly Removal

1. Remove the spring the holder L/R and lever LID L/R and remove the lever LID.
2. Remove the key cassette from the side holder (R) and remove the spring key cassette from the key cassette.
3. Lift the plate cassette upper toward A after taking off the hook of side holder L/R.
4. Lift up the side holder L/R from the cassette holder.

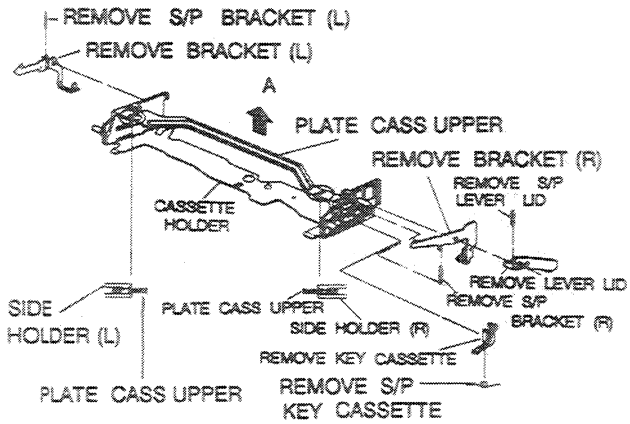


Fig. 18 Cassette Holder Assembly Removal

2-2-8. Side Chassis (L) Assembly Removal

1. Release light shutter spring from side chassis.
2. Remove light shutter after releasing tab as shown in A.
3. Lift up the earth plate to remove.
4. Remove the mask cam lever in the direction of arrow B from the side chassis (L).

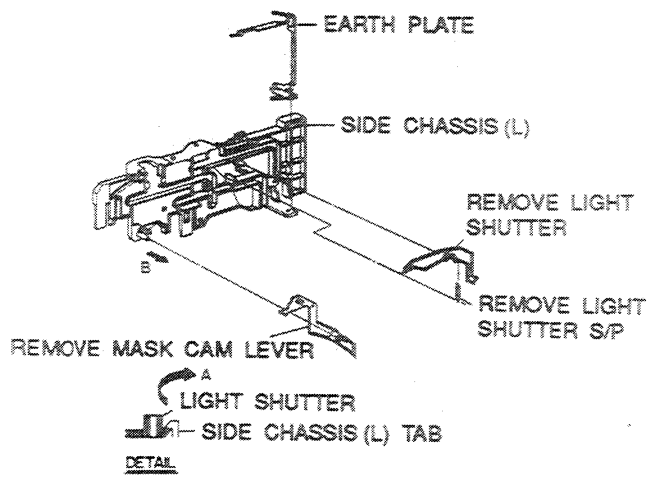


Fig. 19 Side Chassis (L) Assembly Remova

Note: To re-assemble reverse procedure

2-2-9. Joint Gear, Arm Gear and Eject Slide Assembly

1. Assemble the assembly point of the joint gear and the arm gear.
2. Assemble the joint gear with the eject slide as Fig. 20.

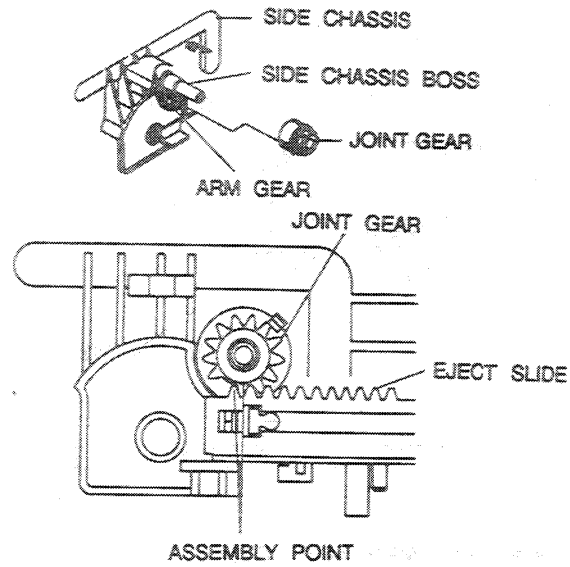
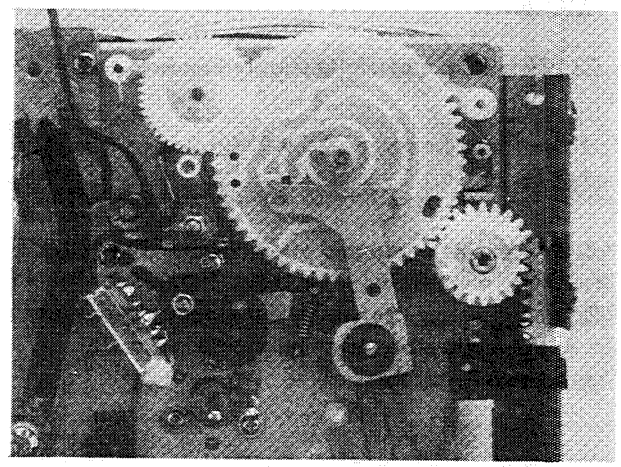


Fig. 20 Joint Gear, Arm Gear and Eject Slide Assembly

2-2-10. Deck Assembly and Assembly of F/L Housing Assembly



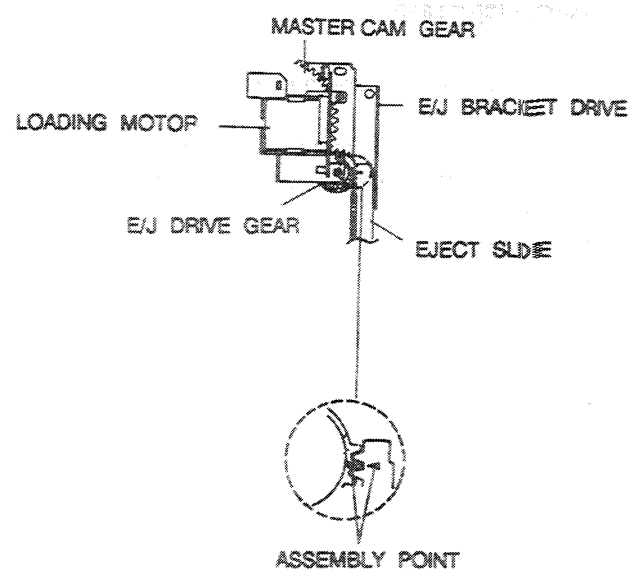


Fig. 21 Housing Assembly Point

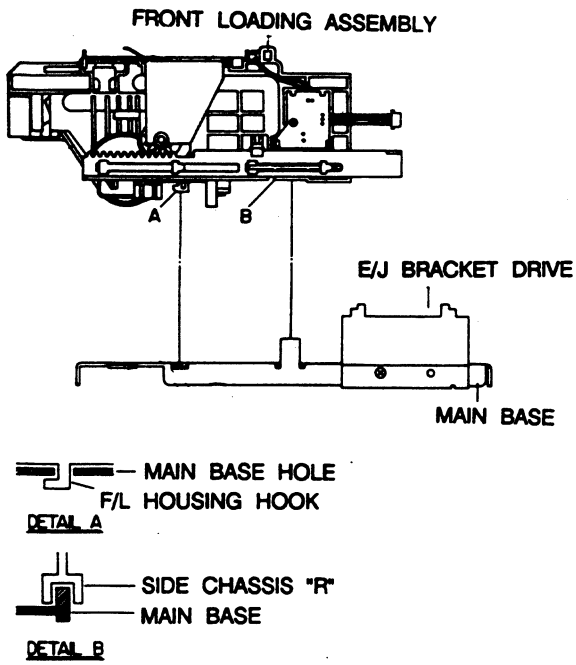


Fig. 22 Mechanism Chassis Assembly Removal

Note : Perform this procedure with mechanism in the eject position.

1. Pull the eject slide gear and assemble the point of E/J Drive Gear and E/J Slide Gear. (Fig. 21)
2. While holding cassette holder in the eject position, align the A and B assembly points as shown in Fig. 22.
3. Tighten two (2) screws.

Note : Recheck A and B position after reinstallation, if incorrect repeat above.

*** Operating the VCR without Housing Assembly**

1. Connect a jumper to short circuit momentarily between pin 1 (ground) and pin 3 (start sensor) of CN6202 on DECK JOINT.
2. After loading, function key is available to be used to select desired mode.

*** Operating the VCR without inserting a cassette tape.**

1. Remove the Housing upper chassis.
2. Push the cassette holder, while hiding the both sensors of LED IR.
3. After loading, function key is available to be used.

2-2-11. Cylinder Assembly Removal

CAUTION : Take extreme care when removing the upper cylinder. Do not touch the video head tips located at the upper cylinder during servicing.

Follow the Procedure for Removing

1. Remove the top cover. (See Fig. 1)
2. Remove the bottom cover. (See Fig. 2)
3. Remove the cylinder ass'y from the main base.
4. Remove two (2) screws from the upper cylinder ass'y.
5. Unsolder PWB-Upper cylinder and then lift upper cylinder.
6. Remove screw from lower cylinder and detach TR holder ass'y.
7. Remove two (2) screws from the motor rotor, then remove it.
8. Remove three (3) screws from the motor stator and remove it.

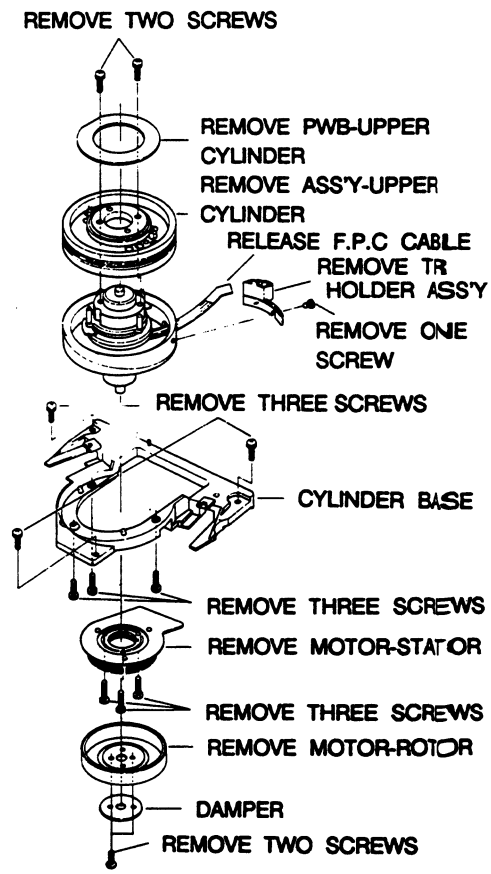


Fig. 23 Cylinder Assembly Removal

2-2-12. Upper Cylinder Removal

1. Unsolder the PWB upper cylinder from the upper cylinder ass'y.
2. Remove two (2) screws from the upper cylinder ass'y and remove it.

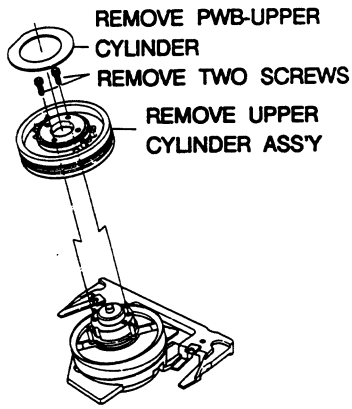


Fig. 24 Upper Cylinder Removal

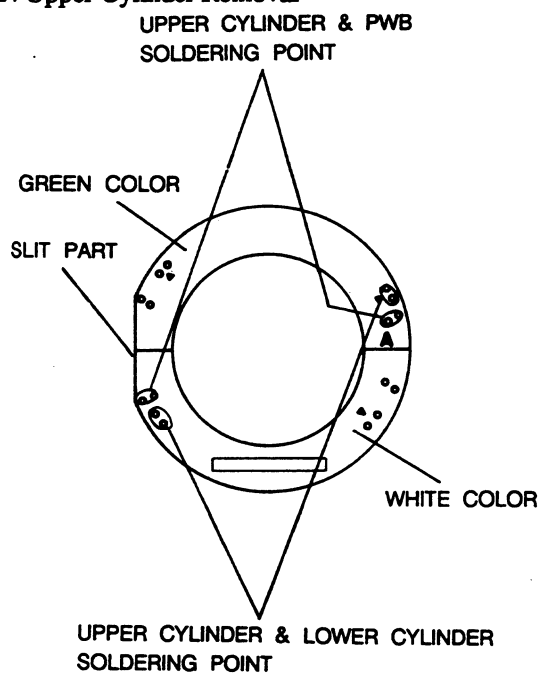


Fig. 25 PWB Upper Cylinder

*** Upper Cylinder Assembly**

1. Fix the slit part of upper cylinder PWB to CH1 head tip of PCB (green) on bottom side. (Fig. 26)
2. Fix the CH1 head tip (green) on bottom side of upper cylinder ass'y to the green PCB of lower cylinder ass'y (Fig. 27) and then solder it.
3. Tighten two (2) screws.

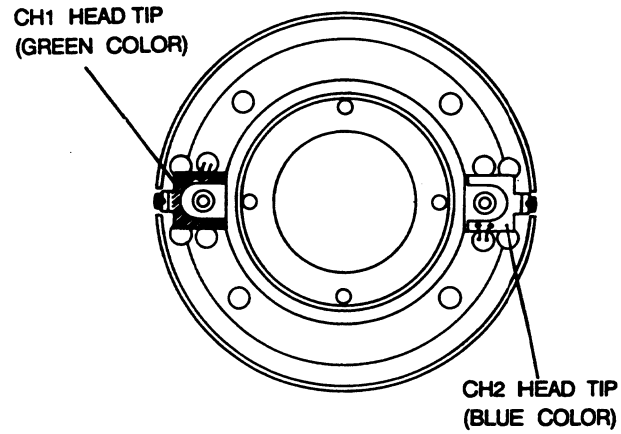


Fig. 26 Upper Cylinder Bottom View

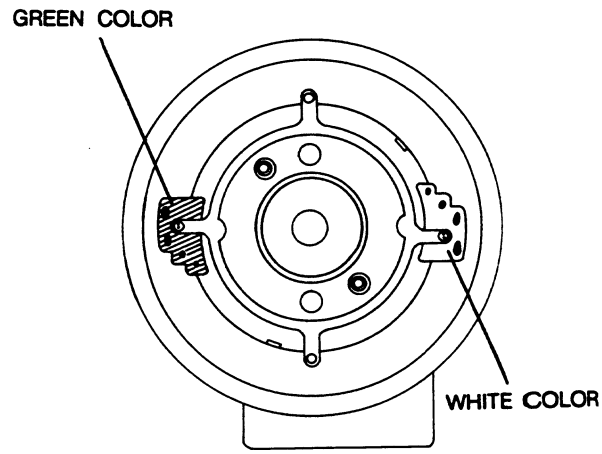


Fig. 27 Lower Cylinder Top View

2-2-13. Lower Cylinder Removal

1. Lift up the lower cylinder from the cylinder base.

Note : Align cylinder base pin before reinstalling.

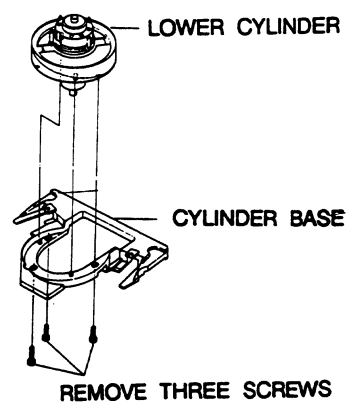


Fig. 28 Lower Cylinder Removal

2-2-14. Cylinder Motor Removal

1. Remove two (2) screws from the motor rotor, then remove rotor.

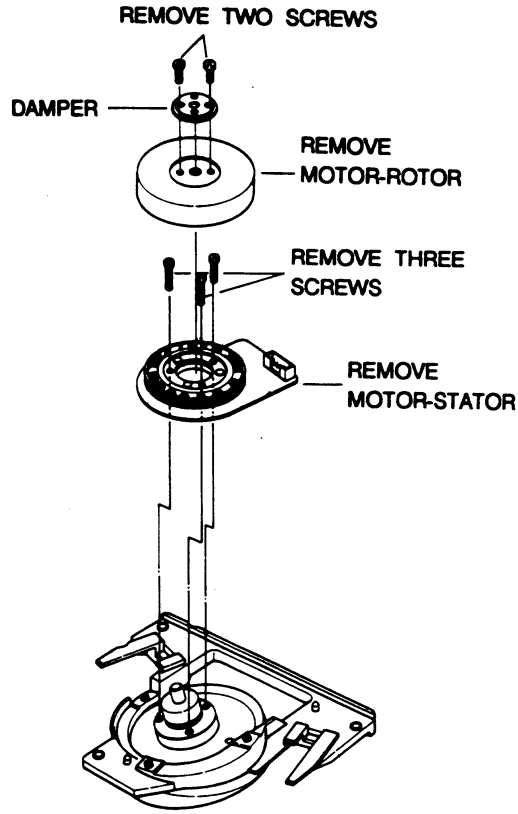


Fig. 29 Cylinder Motor Removal

Note : Mark rotor position to insure correct phase orientation upon reinstallation.

2. Remove threen (3) screws from the motor stator and remove it from the lower cylinder.

*** Motor rotor Assembly**

1. Tighten 2 screws while fixing the hole of cylinder bush and rotor (Fig. 30)

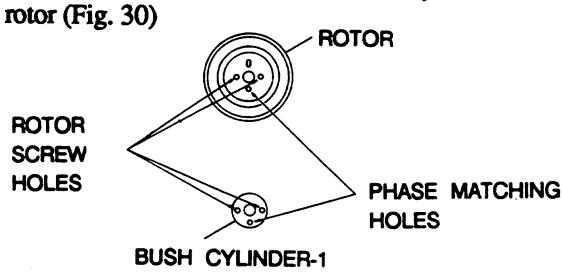


Fig. 30 Motor Rotor Assembly

2-2-15. Cylinder Assembly Removal from Main Base

1. Remove threen (3) screws securing the cylinder base and main base.
2. Lift the cylinder base to remove.

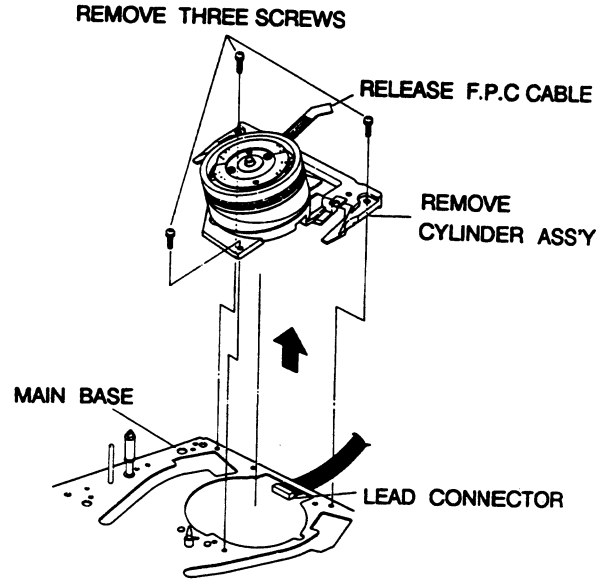


Fig. 31 Cylinder Assembly Removal

2-2-16. Loading Assembly and E/J Drive Bracket Removal

1. Remove the top cabinet. (See Fig. 1)
2. Remove the screw from the PWB joint, and then lift up the PWB joint.
3. Remove three (3) screws of loading unit assembly.
4. Lift up the loading unit assembly
5. Remove two (2) screws securing eject drive bracket from the side of main base.
6. Lift to remove.

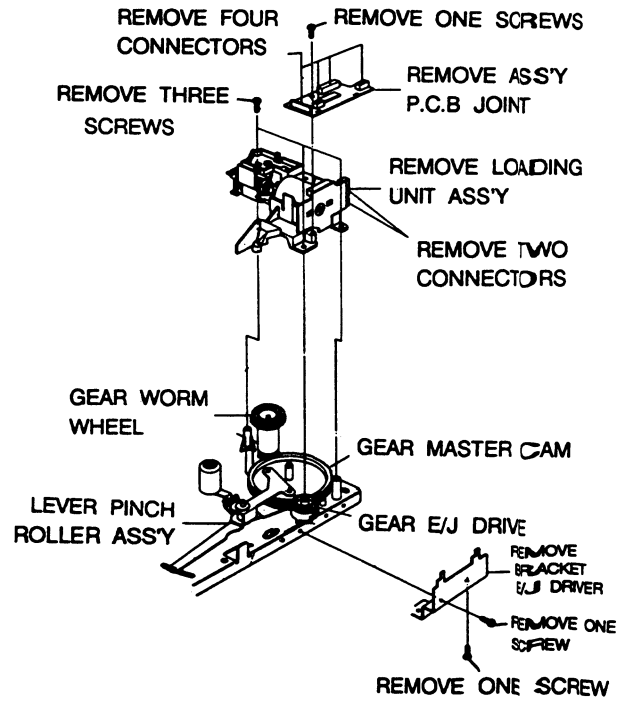


Fig. 32 Loading Assembly and E/J Drive Bracket Removal

2-2-17. Brake Lever Cam Assembly Removal

1. Remove the slit washer from pinch roller stud.
2. Lift up the brake lever cam assembly.

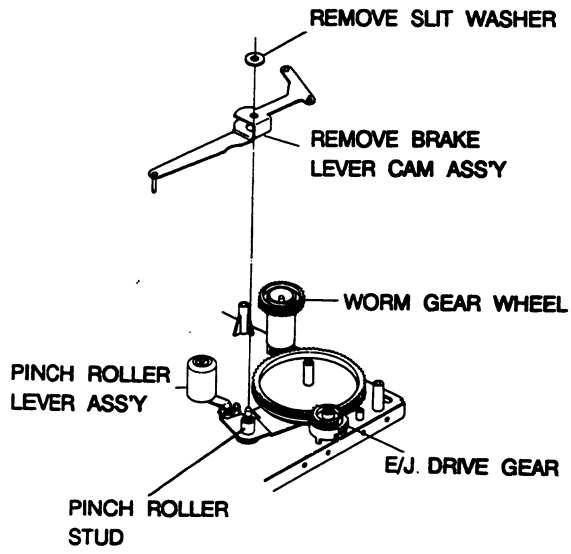


Fig. 33 Brake Lever Cam Assembly Removal

2-2-18. Worm Gear Wheel, Master Cam and Eject Drive Gear Removal

1. Lift up the worm gear wheel.
2. Lift up the eject drive gear.
3. Lift up the master cam gear.

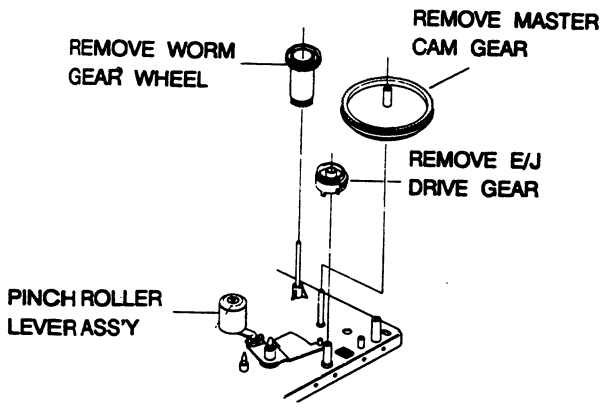


Fig. 34 Worm Gear Wheel, Master Cam and Eject Drive Gear Removal.

2-2-19. Pinch Roller Lever Assembly Removal

1. Lift up the pinch roller assembly.
2. Remove the spring pinch roller.

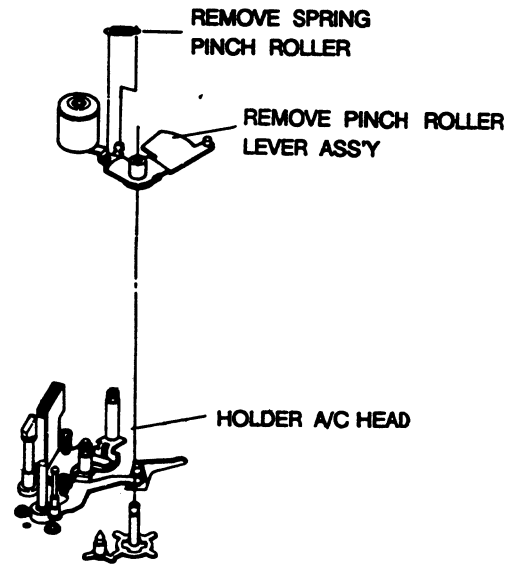


Fig. 35 Pinch Roller Lever Assembly Removal

2-2-20. Sector Gear Removal

1. Remove two (2) slit washers securing sector gear stud and loading gear "R" from the bottom side of main base.
2. Place loading gears in eject position. Lift up the sector gear.

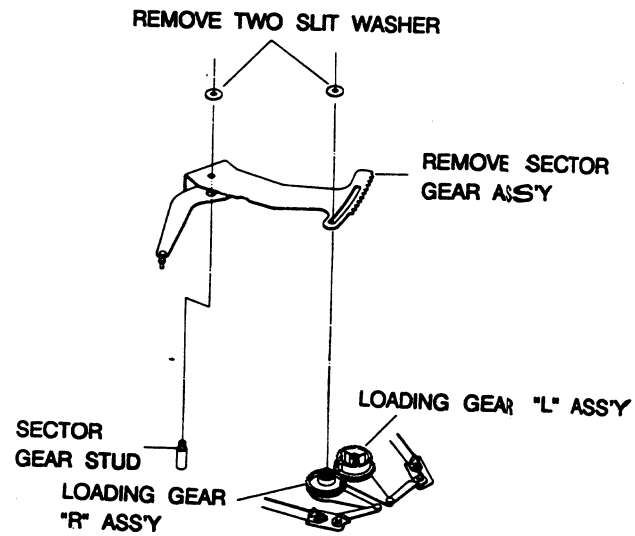


Fig. 36 Sector Gear Removal

2-2-21. Loading Gear L/R Removal

1. Release the tab securing the loading gear ass'y. to the loading gear arm from the bottom.
2. Lift up the loading gear L/R to remove.

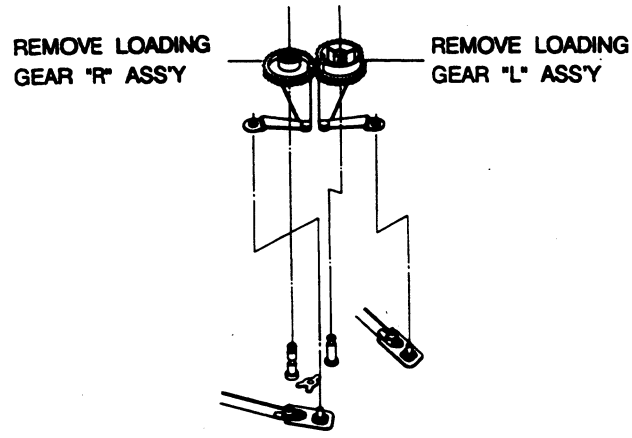


Fig. 37 Loading Gear L/R Removal

2-2-22. Reel Disk "R" Removal

1. Release locking tab on the beneath of the sub brake "R".
2. Remove the sub brake "R".
3. Remove the slit washer.
4. Lift up the reel disk.
5. Remove the plain washer.

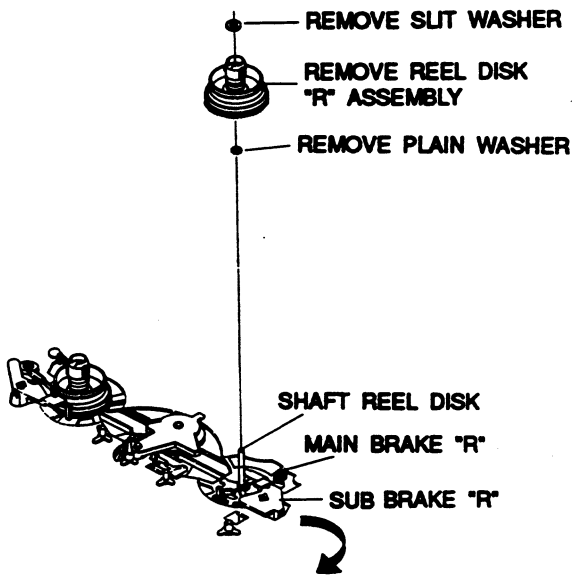


Fig. 38 Reel Disk "R" Removal

2-2-23. Reel Disk "L" Tension Band & Tension Arm Removal

1. Take off the tension arm spring.
2. Align tension arm adjustment with slot in the tension band, the pull up to remove.
3. Release two tabs on tension arm.
4. Remove the tension band.
5. Remove slit washer.
6. Lift up the reel disk "L" after removing the sub brake "L" in the direction of arrow.
7. Remove the plain washer.

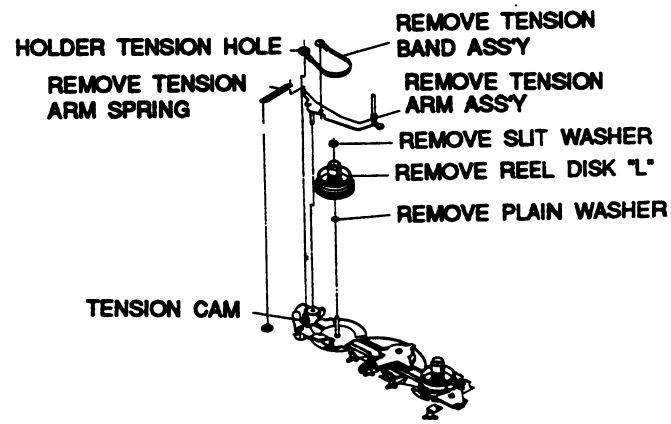


Fig. 39 Reel Disk "L" Tension Band & Tension Arm Removal

2-2-24. Sub Brake L/R Removal

1. Remove the sub brake spring "L". (Refer to the main brake slide removal)
2. Remove the sub brake spring "R". (Refer to the main brake slide removal)
3. Release tab from beneath chassis. Lift up the sub brake L/R.

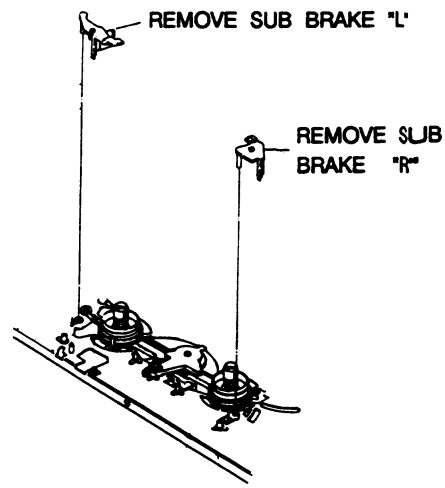


Fig. 40 Sub Brake L/R Removal

2-2-25. Main Brake L/R and Tension Lever Control Removal

1. Remove capstan belt.
2. Remove slit washer securing clutch ass'y.
3. Release main slide yellow spring by unhooking from supply reel tab.
4. Release four (4) tabs and remove main slide.
5. Release tab and remove the tension lever control. Refer to Fig. 41.
6. Release tab and remove main brake left/right.

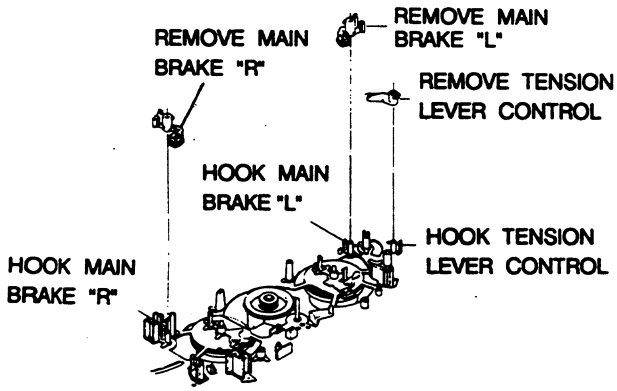


Fig. 41 Main Brake L/R and Tension Lever Control Removal

2-2-26. Capstan Motor and Capstan Motor Brake Removal

1. Remove the D.D capstan brake spring. Turn assembly to release tab.
2. Lift up the D.D capstan brake to remove.
3. Remove capstan cable from PCB.
4. Remove three (3) screws holding the capstan motor from the main base.
5. Remove the capstan motor belt from the capstan motor pulley and the clutch ass'y. Remove motor.

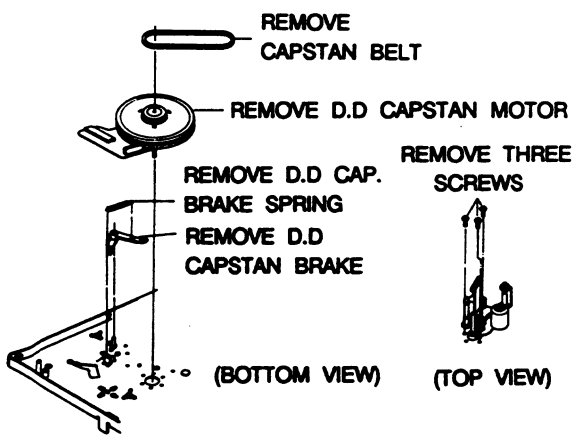


Fig. 42 Capstan Motor and Capstan Motor Brake Removal

2-2-27. Idler Clutch and Shift Lever Removal

1. Remove the slit washer.
2. Remove the clutch assembly.
3. Pull the shift lever toward vertical, push forward chassis back, then up to remove.

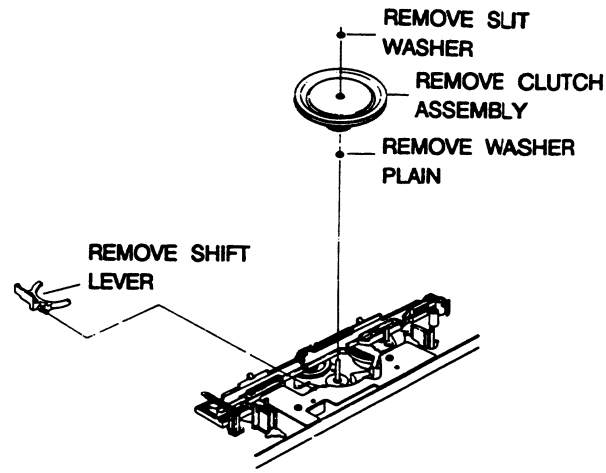


Fig. 43 Idler Clutch and Shift Lever Removal

2-2-28. Main Brake Slide Removal

1. Remove the sub "L" spring.
2. Remove the main slide spring from supply reel tab.
3. Lift up the main brake slide after releasing the securing tabs.
4. Remove the idler shift spring after releasing the securing tabs.

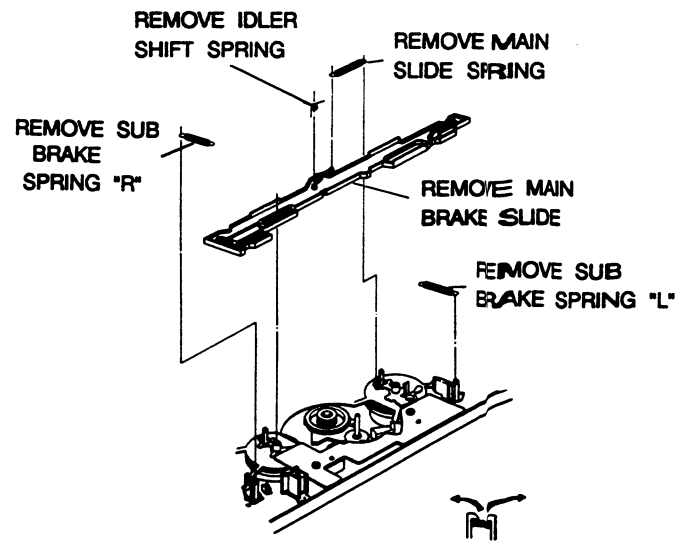


Fig. 44 Main Brake Slide Removal

2-2-29. PWB Reel Removal

1. Disconnect the lead connector assembly.
2. Remove two (2) screws.
3. Lift up the PWB reel.

Note : When reinstalling PWB, pull REC safety switch arm back.

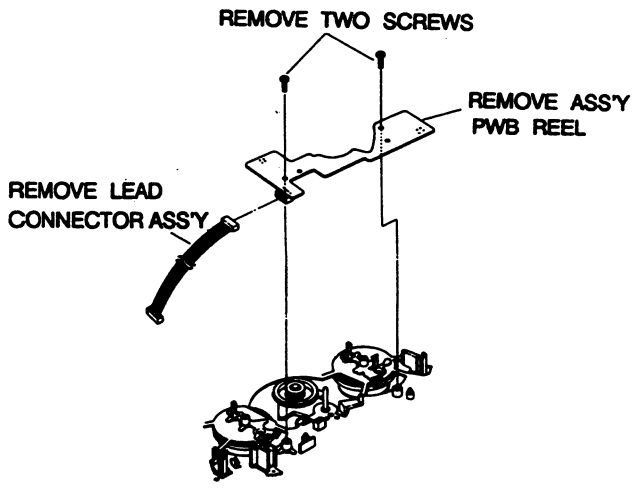


Fig. 45 PWB Reel Removal

2-2-30. Idler Sub Assembly Removal

1. Remove the slit washer.
2. Lift up the idler sub assembly.

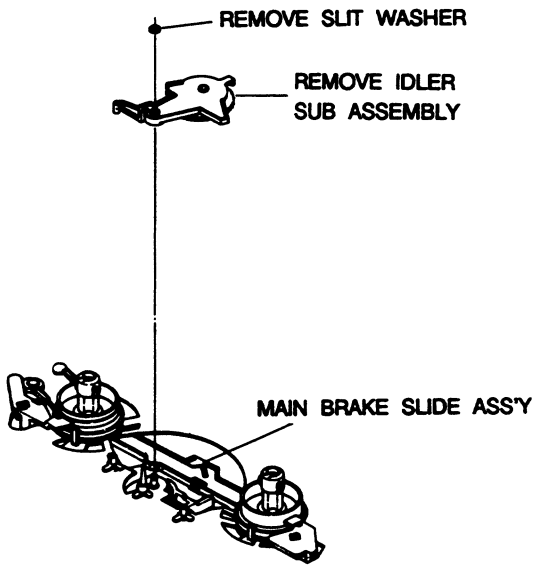


Fig. 46 Idler Sub Assembly Removal

2-2-31. Assembly LED Removal

1. Disconnect the lead connector assembly.
2. Remove one(1) screw.
3. Lift up the LED holder.

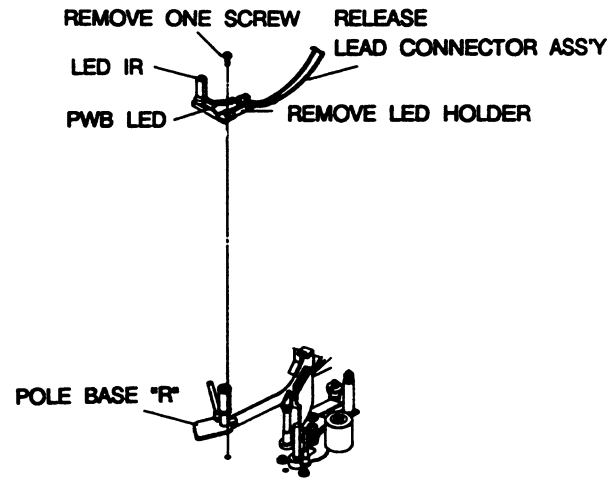


Fig. 47 Assembly LED Removal

2-2-32. Worm Gear Positioning (Eject Mode)

* Assemble in the eject mode. rotate worm gear full counter clockwise.

2-2-33. Pinch Roller Assembly and Master Cam Gear Assembly

1. Fasten pinch roller ass'y to pinch roller stud.
2. Reinstall master cam gear with pinch roller ass'y. in the eject mode. Refer to Fig. 48.

Note : Align the assembly pin with the Master Cam gear alignment hole.

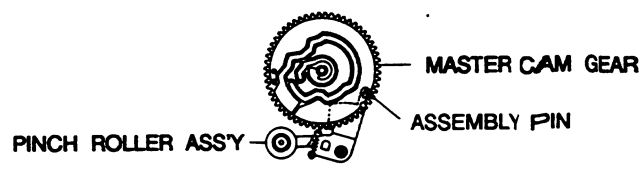
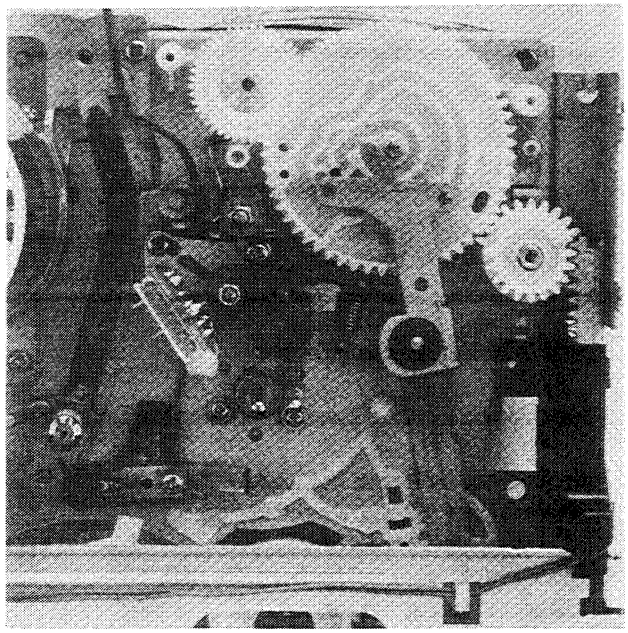


Fig. 48 Pinch Roller Assembly and Master Cam Gear Assembly

2-2-34. Brake Cam Lever, Eject Drive Gear and Master Cam Gear Assembly

1. Assemble the brake cam ass'y. on the pinch lever stud as in Fig. 49.
2. Assemble master cam gear with the brake cam lever ass'y. in eject mode.
3. Assemble gear E/J (eject) drive to stud as shown in Fig. 49, secure with slit washer.

Note : Align arrows on master cam & eject drive gear.



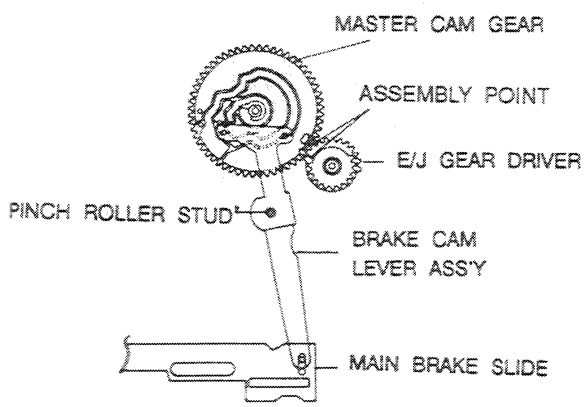


Fig. 49 Brake Cam Lever, Eject Drive Gear and Master Cam Gear Assembly

2-2-35. Ass'y Loading Unit and Master Cam Gear Assembly

1. Align master cam hole with chassis hole.
2. Align program switch arrows, push brake tension lever to align tracking pin as shown in Fig. 50.
3. Align master cam & eject drive gear arrows.
4. Reinstall loading gear ass'y.

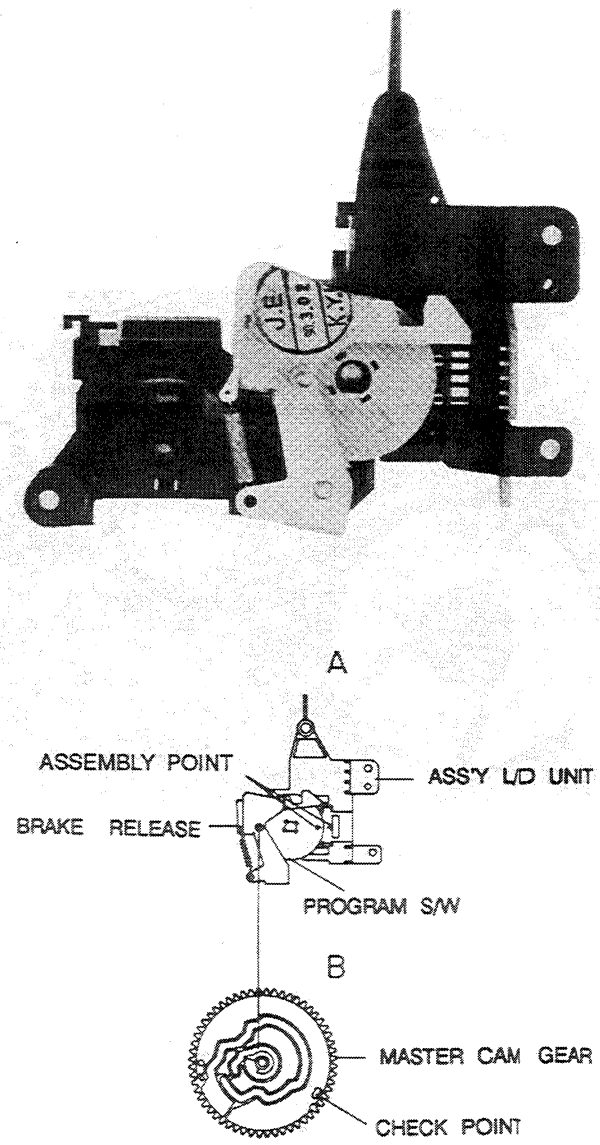


Fig. 50 Ass'y Loading Unit Master Cam Gear Assembly

2-2-36. Sector Gear and Loading Gear Assembly

1. Reinstall the loading gear L/R assemblies in the eject mode while align the timing marks (Fig. 51).
2. Install sector gear and align with timing mark on the supply side loading gear (Fig. 52).
3. Secure with slit washers.

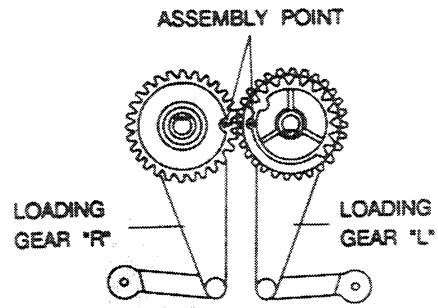
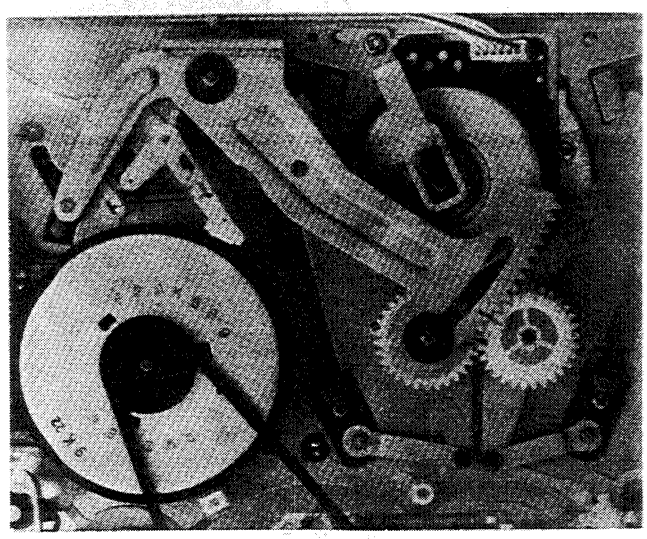


Fig. 51 Loading Gear L/R Assembly Point



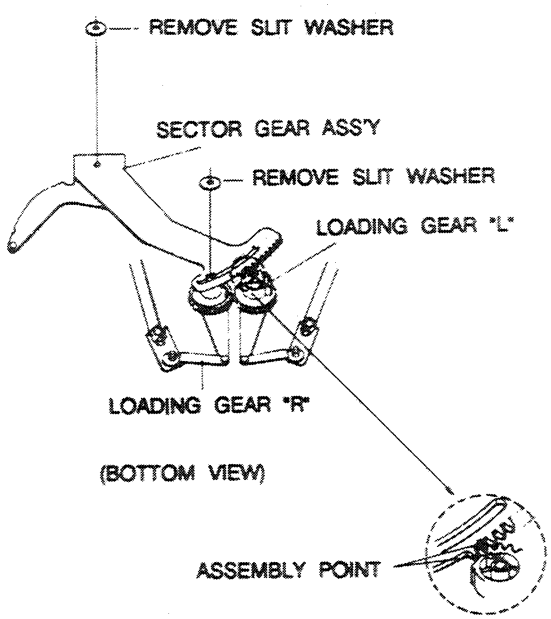


Fig. 52 Sector Gear and Loading Gear Assembly

2-2-37. Pole Base Removal

1. Loosen one (1) screw from bottom of pole base.
2. Slide and remove retainer clips.
3. Remove pole base ass'y.
4. Install in reverse order.

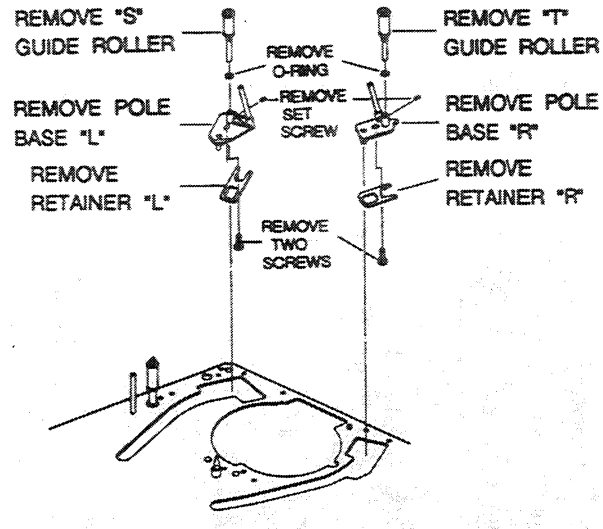


Fig. 53 Pole Base Removal

2-2-38. Audio Control Head Assembly Removal

1. Remove the nylon nut holding A/C head stud.
2. Remove three (3) screws and spring.
3. Lift up the A/C head assembly.
4. Remove A/C head holder from the stud.
5. Lift up the spring torsion A/C.

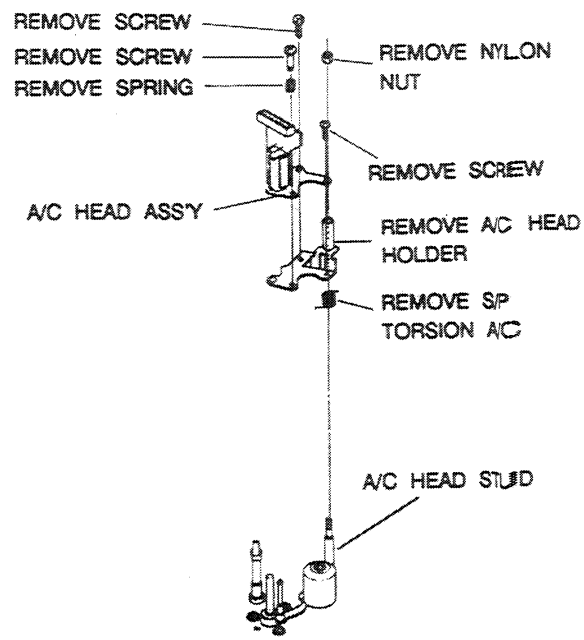


Fig. 54 Audio Control Head Assembly Removal

2-2-39. Review Arm Assembly Removal

1. Remove the nylon nut holding the review arm stud.
2. Lift up the washer plain.
3. Lift up the review arm assembly.
4. Remove the review arm spring.

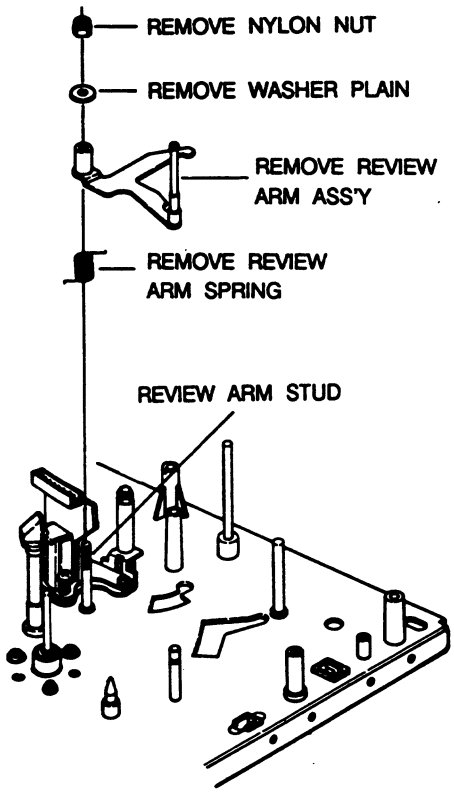


Fig. 55 Review Arm Assembly Removal

2-2-40. Dummy Head Removal

1. Remove the screw holding th Dummy Head and the main base.
2. Lift up the Dummy Head.

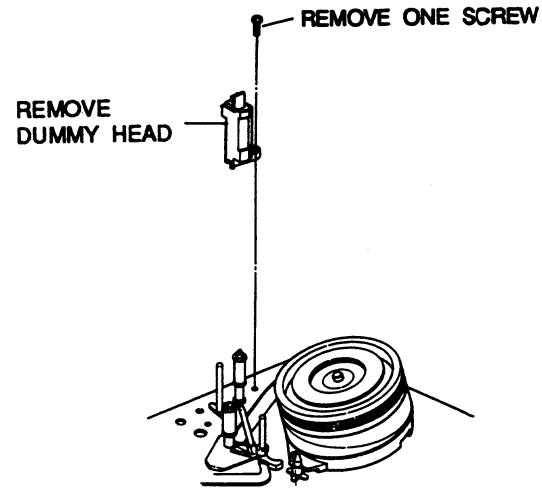


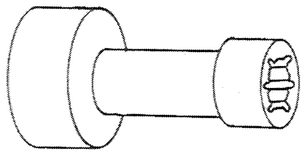
Fig. 56 Dummy Head Removal

3. MECHANICAL ADJUSTMENT

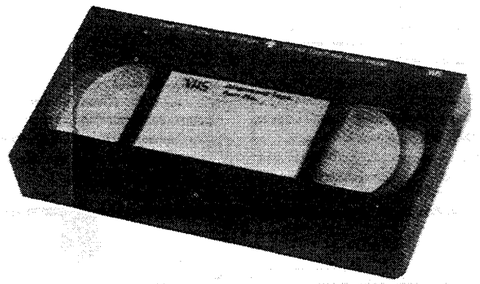
3-1. MECHANICAL ADJUSTMENT TOOLS

NO	JIG ITEM	CODE NO.	SPECIFICATION	DESCRIPTION	SKETCH NO.
1	TORQUE HEAD GAUGE	68140-100-100	COMMON ; LONG	; Use for torque adjustment of Take up / Supply Reel.	A
2	ALIGNMENT TAPE	68140-100-207 68140-100-208 68140-100-209 68140-100-210 68140-100-211	PAL ; SR 1-2 PAL ; SR 2-2 PAL ; SVJ -2 PAL ; SHR 2 -2 PAL ; SHVJ -2	; LION PATTERN ; 6KHz ; COLOUR BAR ; 1KHz ; PROGRAMME (MONO) ; COLOUR BAR (Hi-Fi) ; L-1KHz, R-400Hz ; PROGRAMME (Hi-Fi)	B
3	BACK TENSION CASSETTE TAPE	68140-100-105	COMMON	; Use for back tension adjustment of Supply reel.	C
4	MASTER PLANE AND REEL DISK HEIGHT JIG	68140-110-101	G-10	; Use for height Adjustment of Reel Disk and Deck plate.	D
5	SERVICE JIG KIT	68140-100-301	UPPER DRUM REPLACING JIG	Use for upper drum replacement.	E(A)
			DRIVER HANDLE	Use for connection with each driver.	E(B)
			CAP.ADJ. DRIVER	; Use for CAP nut Adjustment and X-position Adjustment with A/C Head movement.	E(C)
			(+) (-) DRIVER	; Use for screw Adjustment and Audio Azimuth Adjustment.	E(D-G)
			N3 BOX DRIVER	; Use for A/C Head or Roller supply review arm replacement and Tape transport Adjustment.	E(H)
			HEX WRENCH (0.9mm) HEX WRENCH (1.5mm) HEX WRENCH (2.0mm)	; Use for Guide Roller set screw fastening. ; Use for AudioAzimuth Adjustment (Differ from item) ; Use for Drum bush and driver replacement.	E(I)
			CERAMIC DRIVER	; Use for Electrical Adjustment.	E(J)
			HOUSING ASSEMBLING JIG	; Use for Housing Assembly. (Refer to service manual for further information)	E(K)
			TRANSPORT MECHANISM ADJUSTING DRIVER	; Use for height adjustment of Guide Roller for Envelope linearity adjustment.	E(L)

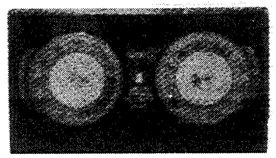
A : TORQUE HEAD GAUGE



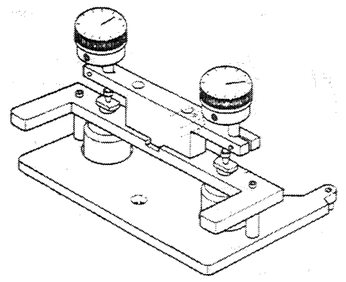
B : ALIGNMENT TAPE



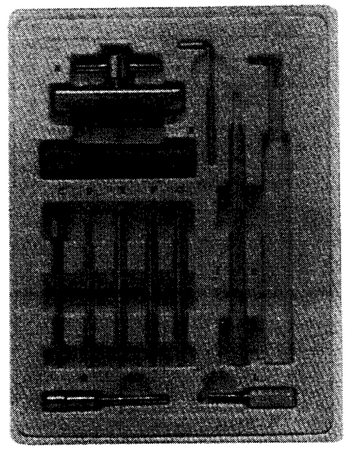
C : BACK TENSION CASSETTE TAPE



D : MASTER PLANE AND REEL DISK HEIGHT JIG



E : SERVICE JIG KIT



(A) UPPER DRUM REPLACING JIG

(B) DRIVER HANDLE

(C) CAP.ADJ.DRIVER

(D-G) (+) (-) DRIVER

(H) N3 BOX DRIVER

(I) HEX WRENCH (0.9mm)
HEX WRENCH (1.5mm)
HEX WRENCH (2.0mm)

(J) CERAMIC DRIVER

(K) HOUSING ASSEMBLING JIG

(L) TRANSPORT MECHANISM ADJUSTING DRIVER

3-2. TAPE TRANSPORT SYSTEM ADJUSTMENT FLOW CHART

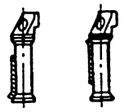
Cylinder assembly replacement
S,T pole base replacement
A/C head assembly replacement
Capstan motor ass'y replacement
Pinch roller ass'y replacement
Cylinder motor replacement
Review arm replacement

S,T guide rollers replacement
Tension level ass'y replacement
FE H'd replacement

Idler clutch assembly replacement
Reel disk replacement
Cam adjustment replacement

1) A/C H'D ass'y adjustment

1. Audio H'D tilt adjustment.
Playback a E-180 tape and adjust lower flange of the review arm for no wrinkle

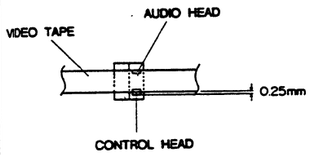


Turn counter clockwise to correct

Turn clockwise to correct

2. Audio azimuth adjustment.
Playback 6KHz audio signal in alignment tape SR 1-2 and adjust for max. output.

3. Audio H'd height adjustment.
Set the deck to playmode, and adjust head height until lower head edge matches to lower tape.
Playback 1KHz audio signal in alignment tape SR2-2 and adjust for max. output.



Adjust head height 0.25mm between lower head gauge and lower tape edge.

4. A/C H'd position adjustment.
Playback SP mode SR1-1 video signal in alignment tape. Set tracking control at it's center. Adjustment taper nut for max. envelope output.

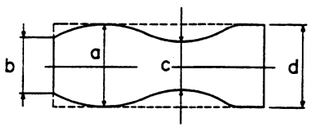
2) Linearity adjustment(S,T guide roller)

1. Maximum envelope output
Playback SP mode monochrome video signal in alignment tape SR1-2. Trigger the scope with switching pulse (A ch). Turn tracking control for maximum envelope output.

2. Entrance side envelope adjustment.
Rotate S-guide roller until entrance side envelope becomes as flat as possible.

3. Exit side envelope adjustment
Rotate T-guide roller until exit side envelope become as flat as possible.

4. Linearity check
Turn tracking control clockwise and counter clockwise.
Make sure the envelope increases or decreases keeping flat response.



a b c d
c, b, d / a ≧ 0.63

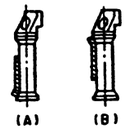
3) A/C assembly fine adjustment

1. Audio azimuth adjustment and height adjustment.
Playback SP mode video signal in alignment tape SR1-2.
Measure 6KHz audio signal output with milivoltmeter.
Adjust azimuth adjusting screw and nut for maximum output.

2. A/C H'd position adjustment
Set tracking control to it's center click position. Playback SP mode white video signal in alignment tape SR1-1 and adjust cam adjustment for maximum envelope output. Playback alignment tape SR1-2 and make sure envelope is still maximum. If envelope is not maximum, adjust envelope in SP mode again.

4) Review arm adjustment(REV mode)

1. Tape wrinkle check.
Run E-180 tape in review mode. Make sure tape wrinkle at upper or lower flange of guide tape.



5) Check transitional operation from Review to Play

Playback programme tape (SP) in Review mode and then change the mode to Play.

Make sure that entrance side envelope changes to envelope for normal Play mode within 3sec.

Steady state is obtained within 3 sec. — YES

NO

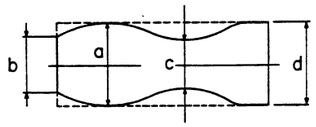
Make sure the gap between lower flange of supply roller and lower tape edge.

Adjust entrance side envelope with S-guide roller.

Run E-180 tape in Review mode and then change the mode to Play mode. If there are the gap or the wrinkle of tape in lower flange of supply roller replace the pole base "L".

6) Envelope check (Playing the same VCR used for recording)

Record signals on E-120 and E-180 tapes in SP mode, respectively and playback the signals.



a b c d
c, b, d / a ≧ 0.63

7) Tape wrinkle check

Run E-180 tape in each mode and make sure no wrinkle is caused at each guide.

Play mode	Wrinkle at guide roller	TO 2)
	Wrinkle tape at guide flange	TO 1)
	Wrinkle at supply roller	TO 5)
Play advance mode	Wrinkle at tape guide flange	TO 2)
Review	Wrinkle at tape guide flange	TO 4)

Return to the item numbered and perform adjustment again.

NOTE : In the Linearity adjustment in item 2) the adjusted value should be checked both SP tape.

3-3. TAPE TRANSPORT SYSTEM

Note :
The tape transport system has been adjusted precisely in the factory. Alignment is not necessary except for the followings :

* Noises observed on the screen.
* Tape damage.
* Parts replacement in the tape transport system.

3-3-1. Location of tape transport adjustment (Adjustment reference)

Lower flange height of tape guide is used as the basic reference for the transport adjustment. To keep height of the tape guide, do not apply excessive force onto the main base to prevent deformation.

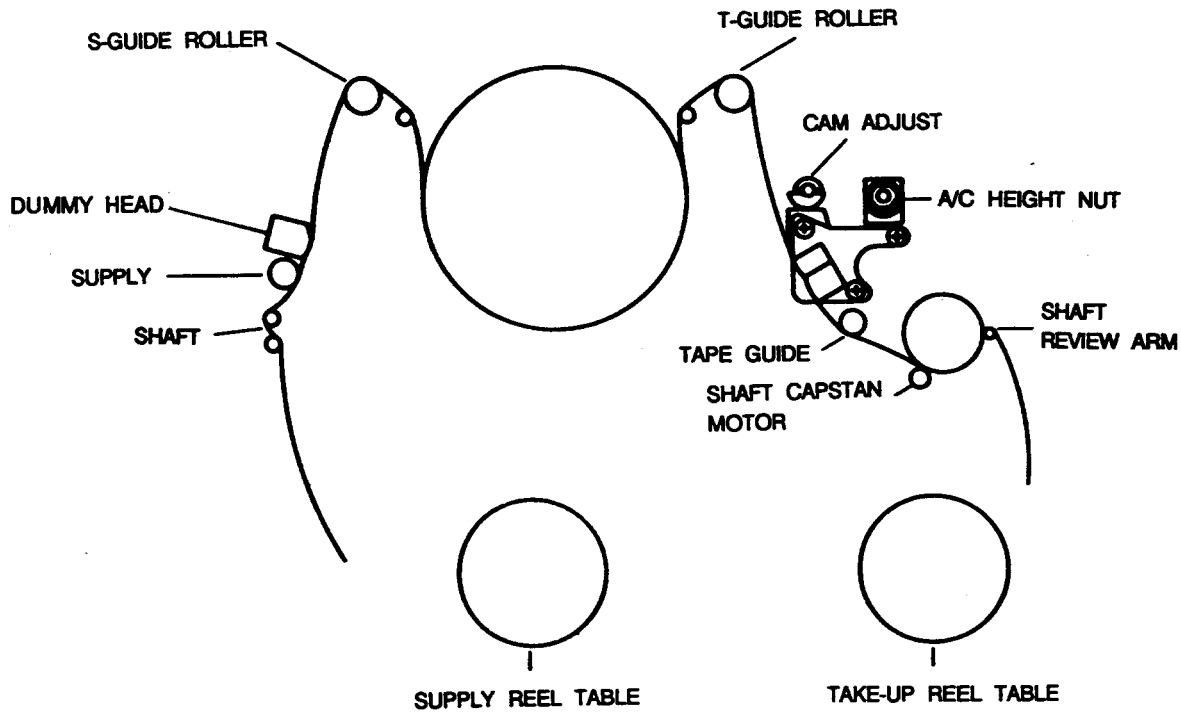


Fig. 1 Location of tape transport adjustment

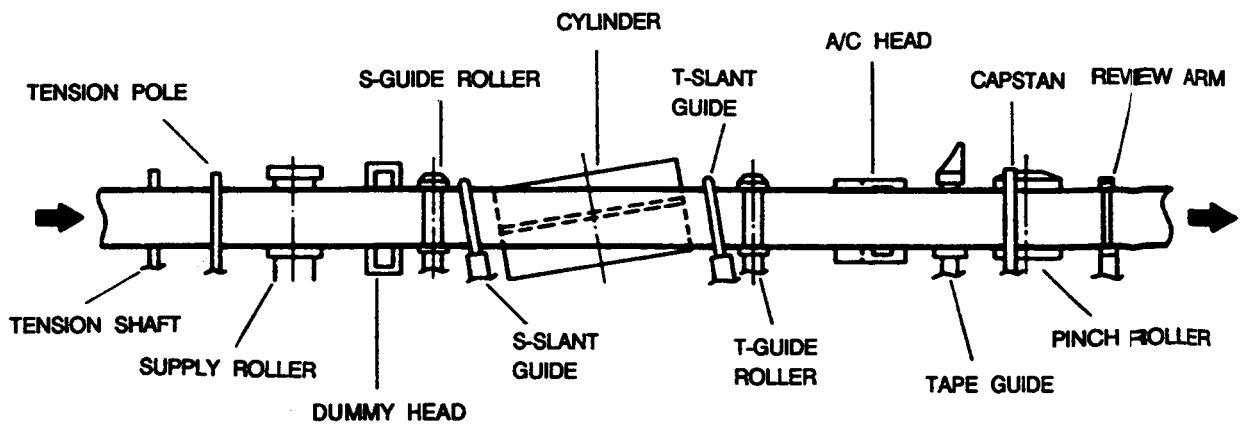


Fig. 2 Tape travel diagram

3-3-2. Tape transport system adjustment

1) Pre-adjustment

When the part (s) are replaced, perform required adjustments by referring to procedures for the tape transport system. When the part (s) are replaced, the tape path may be changed.
First run an E-180 tape and make sure excessive tape wrinkle does not occur at each tape guide.

1. If tape wrinkle is observed at the S, T-guide rollers, turn the S, T-guide rollers until wrinkle disappears.
2. If the tape wrinkle is still observed at the tape guide, perform the tilt adjustment of the A/C head.

2) Adjustment procedures

1. A/C Head Assembly Adjustment

a. A/C tilt adjustment

1. Playback an E-180 tape and observe running condition of the tape at the lower flange of tape guide.
2. Adjust the A/C tilt adjusting screw until tape wrinkle is caused at the lower flange of tape guide as shown in Fig. 3 (A).
3. Turn the A/C tilt adjusting screw counter clockwise until the tape travels along the lower flange as shown in Fig. 3 (B).

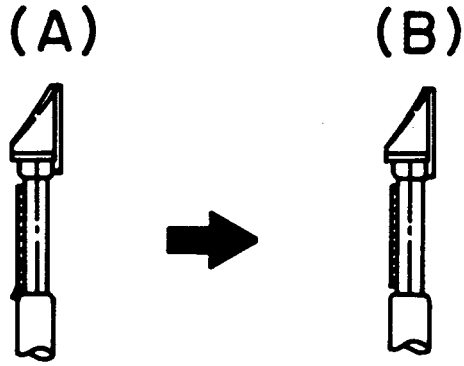


Fig. 3 Tape guide check

b. Audio Azimuth Adjustment

1. Load alignment tape (SR1-2 : 6KHz) and playback the 6KHz signal.
2. Connect channel-1 scope probe to TP501.
3. Adjust screw (B) vertically, to achieve maximum audio level.
4. Adjust screw (C) and hex nut to achieve maximum audio level.

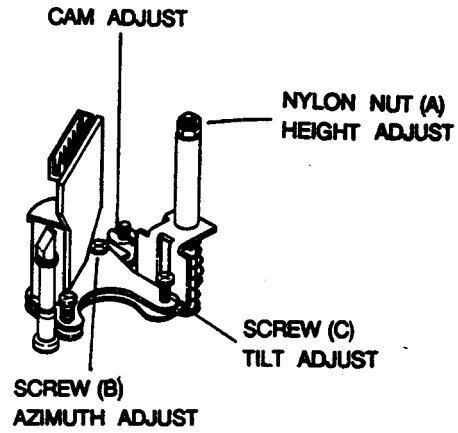


Fig. 4 A/C head assembly

c. Audio head height adjustment

1. Run the alignment tape SR2-2 in the playback mode.
2. Observe surface of the audio head using a dental mirror.
3. Turn the A/C height adjusting nut until the gap of lower tape edge and the lower edge of the control head is about 0.25mm shown in Fig. 5.
4. Playback the 1KHz audio signal in the alignment tape and adjust the head height for maximum audio output.

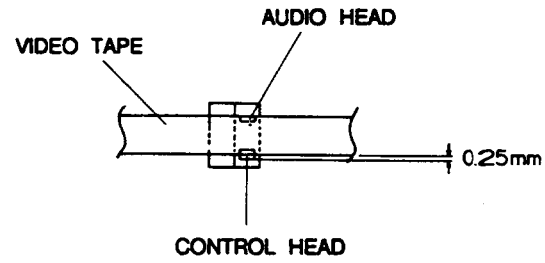


Fig. 5 Head Height

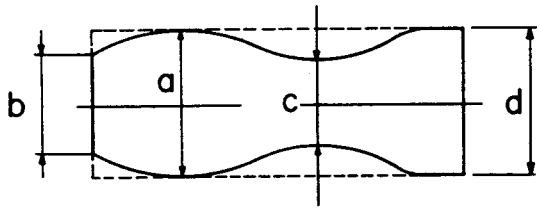
d. A/C Head Position Pre-adjustment

1. Playback the SP mode, video envelope on the SR1-2 alignment tape.
2. Adjust the CAM adjust for maximum video envelope output make sure tracking control is set at its center position.

2. Linearity adjustment (S, T-guide rollers adjustment)

1. Playback the mode, video envelope on the SR1-2 alignment tape.
2. Observe the video envelope signal on an oscilloscope triggered by the video switching pulse.
3. Make sure the video envelope waveform (in its maximum output) meets the specification shown in Fig. 6. If it is not, adjust as follows :

Note :
a=maximum output of the video RF envelope
b=minimum output of the video RF envelope at the entrance side
c=minimum output of the video RF envelope at the center point
d=minimum output of the video RF envelope at the exit side.



a b c d
c, b, d / a ≧ 0.63

Fig. 6 Envelope Waveform Adjustment

4. If the section A in Fig. 7 does not meet the specification, adjust the S-guide roller up or down.
5. If the section B in Fig. 7 does not meet the specification, adjust T-guide roller up or down.

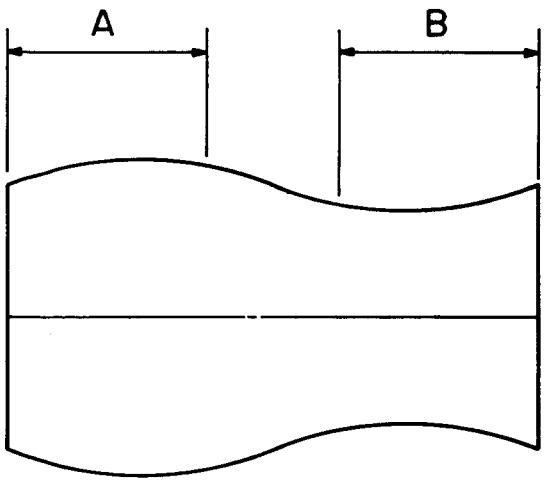


Fig. 7 Adjustment Points

6. After completion of the adjustment (s), vary tracking control from one end to the other and make sure video envelope variations are almost flat.
7. If the envelope varies as shown in Fig. 8 adjustment of the S, T-guide rollers may be upset, so perform the adjustment again.

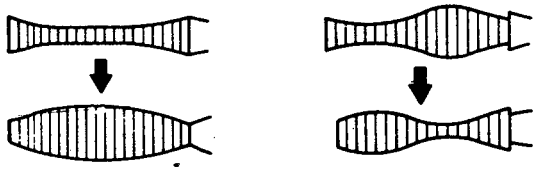


Fig. 8 Abnormal variation of the waveform

3. A/C Head Assembly Fine Adjustment

a. Tape wrinkle check at the lower flange of tape guide.

1. If tape wrinkle is observed at the lower flange of tape guide, adjust the A/C tilt adjusting screw counterclockwise as shown in Fig. 3 until the wrinkle disappears.
2. If a gap is observed between the lower flange of tape guide and the lower edge of tape, adjust the A/C tilt adjusting screw clockwise until the tape travels along the lower flange.

Note :
This adjustment should be done using a beginning part of E-180 tape.

b. Azimuth Adjustment

1. Playback the SP mode, 6KHz audio signal on the alignment tape SR1-2.
2. Adjust the A/C azimuth adjusting screw for maximum audio output as shown in Fig. 4.

c. Head height adjustment

1. Playback the alignment tape (SR2-2).
2. Adjust the A/C head height adjusting nut for maximum audio output.

d. A/C Head Position Adjustment

1. Playback the mode, white video envelope signal on the alignment tape (SR1-2).
2. Trigger the oscilloscope with the video switching pulse and observe the video envelope waveform.
3. Turn the cam adjust slowly and fix the taper nut at the position where the video envelope reaches a peak level.

4. Review Arm Guide Lever Adjustment

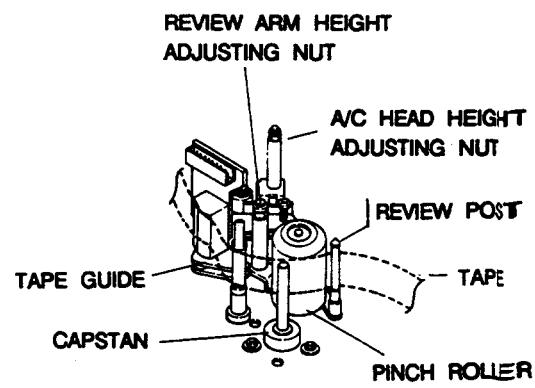


Fig. 9 Review Arm Guide Lever Adjustment

1. Set the VCP to FPS mode with E-180 tape (at beginning portion) loaded. Switch the FPS mode to review mode, after some tape has been wound into T-reel table.

2. Check tape wrinkle at the upper and lower flange of tape guide. Adjust the review arm so that the tape runs along the lower flange.
3. Set the VCP to the FPS mode again and make sure the tape is not twisted between the capstan and the review arm guide.
   If it is twisted again, adjust the review arm guide height and the adjustment in step 1.

5. Check For Transitional Operation From Review to Play

Check transition from review mode to play mode, using a pre-recorded tape, make sure the entrance side of envelope comes to an approprate steady state within 3 seconds, shown in Fig. 10.

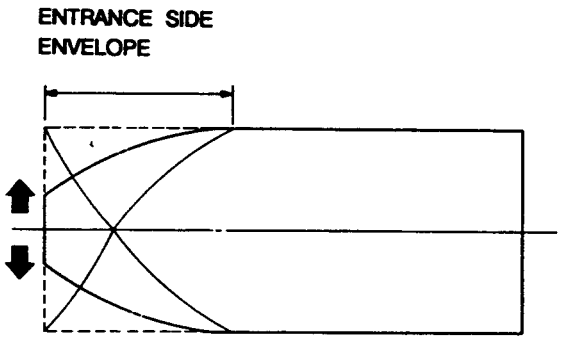


Fig. 10 Video envelope rising when operation mode is switch from review to play mode.

If it does not rise within 3 seconds, adjust as follows:

1. Make sure there is no gap between supply roller lower flange and tape. There is no adjustment for this.
2. Change operation mode from the review to the play mode again and make sure entrance side of envelope rises within 3 seconds.
3. If the envelope rises up then replace either the lower cylinder or base pole "L" then adjust again.

6. Envelope Check

1. Make recordings on E-120 and E-180 tapes, and make sure the playback output envelope meets the specification shown in Fig. 11.
2. In playback mode using the same video deck as used for the recording, (with an E-120) the video envelope should meet the specification shown in Fig. 11. In mode, (A) should be same as (B). If the difference is excessive then the upper cylinder should be replaced.

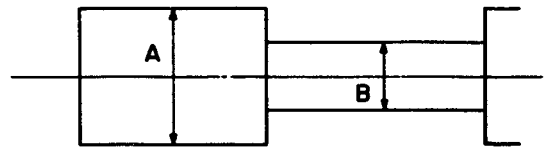


Fig. 11 Envelope output and output level difference

7. Tape Wrinkle Check

1. Run the E-180 tape in the playback, FPS, review and the pause mode and then observe tape wrinkle at each guide.
2. If excessive tape wrinkle is observed at the mode shown below, perfrom the associated adjustment also shown below.

a. Playback mode

Tape wrinkle at the S,T-guide roller section : Linearity adjustment. (S,T Guide Rollers Adjustment)
Tape wrinkle at tape guide flange : A/C head assembly adjustment.

b. Review mode

Tape wrinkle at tap guide : Review arm guide lever adjustment.

3-4. REEL TORQUE

3-4-1. General Features.

1. The rotation of the capstan motor operates the ass'y clutch through the capstan motor which is directly connected to the assembly clutch.
2. Brake operation and shift operation in FF/REW by one slide way.
3. Trasportation of accurate driving force by gear tape (clutch ass'y).
4. Auto torque is converted by CAM system automatically.

MODE	TORQUE g/cm	GAUGE
PB/REC	60 - 110	Cassette Torquement
RPS	120 - 180	Cassette Torquement
FF/REW	Above 1000g/cm	Torque Gauge

Note :
If the Spec is out of above, replace the clutch ass'y and check it.

3-4-2. Location of Tension Pole and Back Tension Adjustment

1. Remove the housing ass'y and set the deck to play mode.
2. Adjust the cam tension to set at 0.5 +/-0.2 from the center of supply roller.
3. The back tenstion meter should be used for adjustment of back tension.

Check back tension, should be 42 +/- 10g.cm.
If not, check while adjusting cam tension.

Counter-Clock wise : Torque UP
Clock wise : Torque DOWN

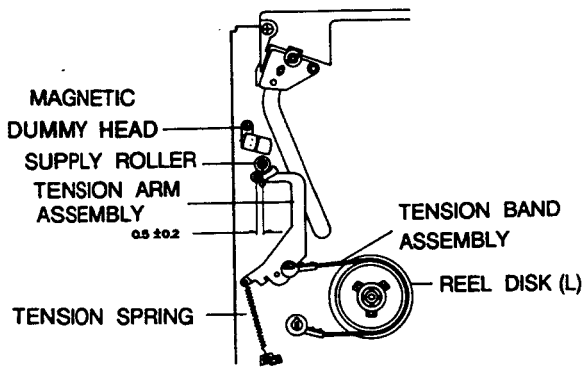


Fig. 12 Tension Pole and Back Tension Adjustment

3-4-3. Reel Torque Adjustment

1. Reel Torque Adjustment

a. Review mode

Excessive torque may damage the tape, however poor torque not wind the tape.

b. REC/PLAY BACK (Take-Up) mode

Weak torque can not wind the tape to the end, however excessive torque may make the tape expand.

BACK TENSION METER

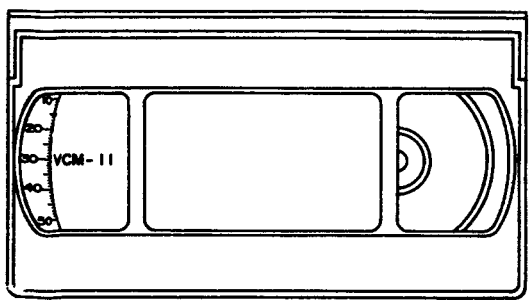


Fig. 13 Back Tension Tape Torque Cassette

c. Inspection

Rewind the torque cassette which is recorded in SP mode to the end and measure the torque shown below.
Rewind Torque :120 - 180g.cm.
Record/Playback Torque : 60 - 110g.cm

2. Reel Torque Check

a. Load the torque cassette in the VCP and fast forward the tape before proceeding with measurement.
b. Set the VCP to the REVIEW mode and feed the tape for about 15 sec., and then make sure the take-up torque of 120-180g-cm is obtained while observing the left torque meter.
c. After completion of step 3, set the VCP to the PLAY mode and feed the tape for about 30sec.
Read the right torque meter and check whether the torque of 60-110g.cm is obtained.
d. When the review torque and playback torque are out of limit, replace the clutch assembly.
e. When the clutch assembly is replaced, perform the reel torque check.

3. Precautions for Usage of Torque Cassette (KT-300NR)

a. Before loading a torque cassette in a VCP, always remove tape slack.
The tape slack can be removed by rotating the reel to its take-up direction. (The tape tends to slack when there is no reel brake actions).
b. When the torque cassette is loaded, confirm the following.
b-1. Make sure the tape does not ride up or over the tape guide cap. If it does, do not eject the tape but bring the tape to its correct position, taking care not to damage the tape.
b-2. Make sure the tape has no slack, if it has slack, operate the VCP in FF or REW mode and then stop the tape. Then make sure the tape has no slack.
b-3. After above confirmation, proceed to the reel torque adjustments and confirmation.
c. Cautions for removal of torque cassette.
c-1. When removing the torque cassette from the VCP, set the VCP to the STOP mode and wait for several seconds. Then, make sure the tape has no slack. Push the EJECT button to remove the cassette.
c-2. When removing the torque cassette from the VCP, also make sure the tape has no slack inside the cassette lid before pulling the cassette from the VCP.
If the tape has no place and then pull the cassette.
If the tape has no slack inside the lid, carefully bring the tape in place and then pull the cassette.

d. If the previous precautions 1,2 and 3 are not performed properly, the tape may be damaged and correct measurements can not be performed.
e. Do not use worn out or damaged tape, if they are used they may damage video heads on the cylinder. In such a case, always replace the tape with a new one.

4. Reel Disk Height Adjustment

1. Set the jig for reel disk height to the reel disk L,R as shown in Fig. 14.
2. The needls of L,R should be located within +/-0.05 limits.

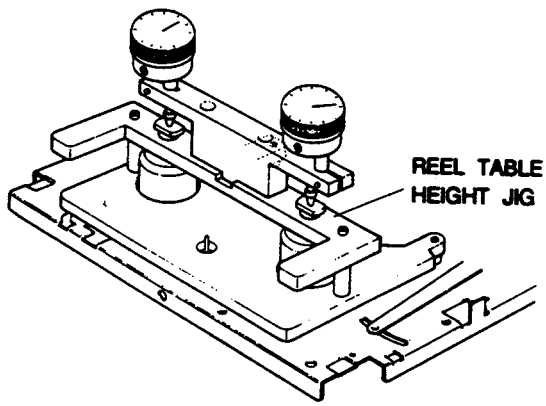


Fig. 14 Reel Disk Height

4. ELECTRICAL ADJUSTMENT

4-1. SERVO SECTION in Main A PCB

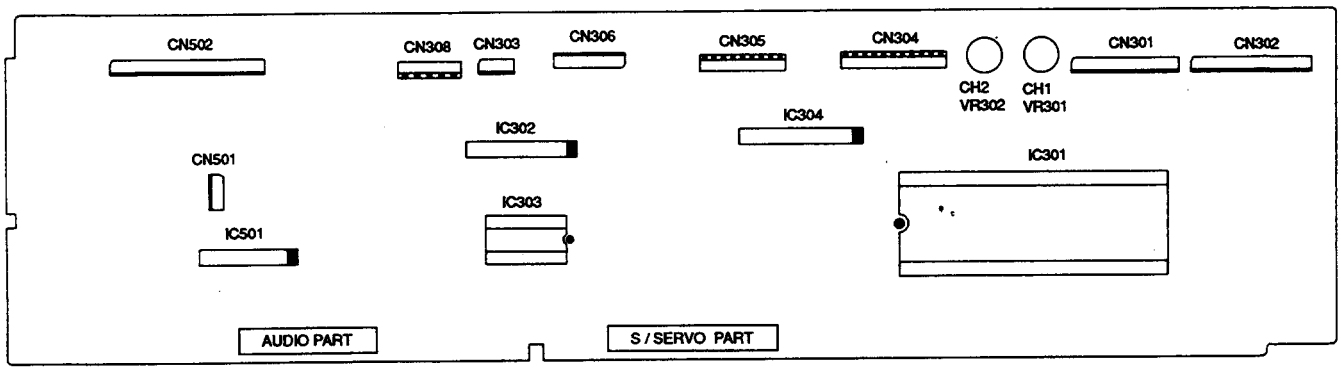


Fig. 1 Location of Main A PCB Component side

4-1-1. PG (Pulse Generator) Shifter Adjustment

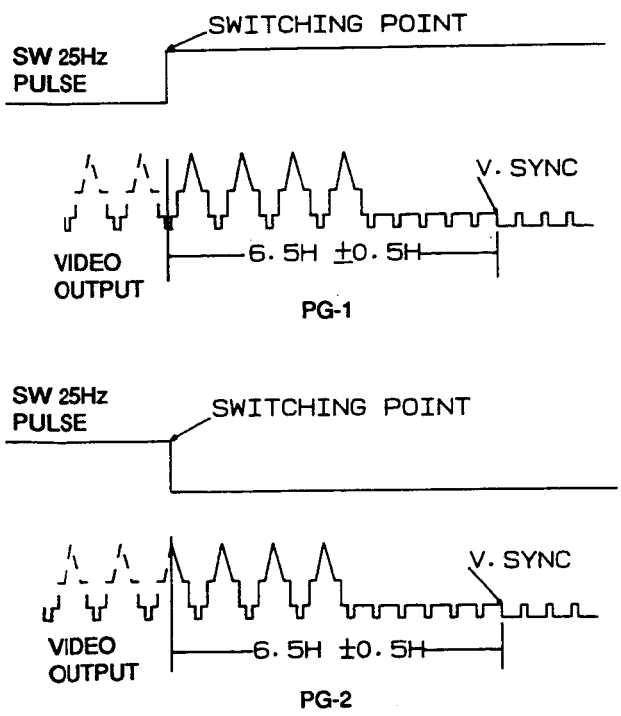


Fig. 2 PG Shifter Adjustment

Mode	Playback
Signal	Color bar or Monochrome
Test Point	TP402 ; H'd SW 25Hz Video out Jack ; Video out Signal
Equipment	Oscilloscope, SR 2-2Tape
Adjustment	VR301 (PG-1), VR302 (PG-2)
Specified Value	6.5 +/- 0.5H

Adjustment Method

The pulse Generator (PG) Shifter determines the video head switching point during playback. Misadjustment of the PG Shifter may cause head switching noise in the picture and/or vertical jitter.

1) Load an alignment tape and playback the color bar signal or monochrome signal.
2) Connect channel-1 scope probe (1V/div.;50u/div.) to TP402. Trigger the scope on channel-1.
3) Connect channel-2 scope probe (1V/div.) to video out jack.
4) Set the scope to (-) slope and adjust the PG-1 shifter control (VR301) as in the PG-1.
5) Set the scope to (+) slope and adjust the PG-2 shifter control (VR302) so that the trailing edge of the SW25Hz pulse is 6.5+/-0.5H (Horizontal) lines before the start of vertical sync pulse.

4-2. VIDEO SECTION in Main B PCB

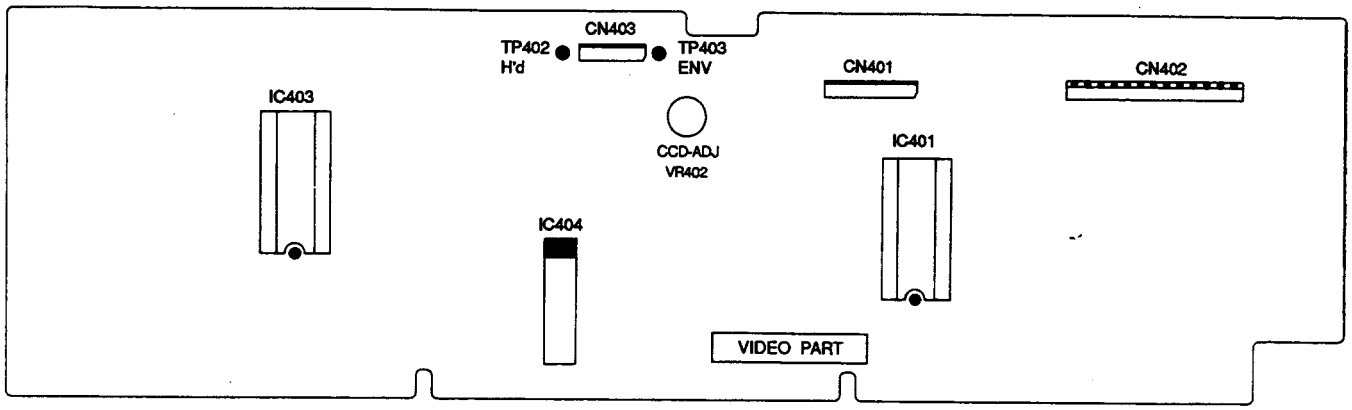


Fig. 3 Location of Main B PCB Component side

4-2-1. CCD IN (CLAMP) Adjustment

Mode	Playback
Signal	Color bar
Test Point	Pin 10 of IC401
Equipment	Oscilloscope, SR 2-2 Tape
Adjustment	VR402
Specified Value	0.55Vp-p

Adjustment Method

This adjustment is for the drop out compensation.
When there is the drop out, if the CCD output level is very low, the black trigger occurs.
If the level is very high, the white trigger occurs.

1) Connect channel-1 scope probe (0.1V/div.) to pin 10 of IC401.
2) Load an alignment tape and playback the color bar signal. (Alignment tape SR 2-2)
3) Adjust the CCD IN Control (VR402) for 0.55Vp-p

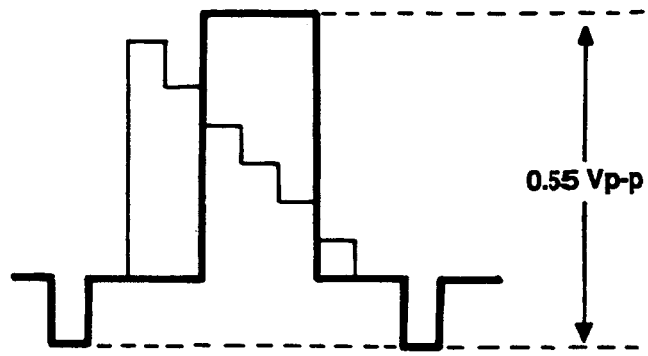
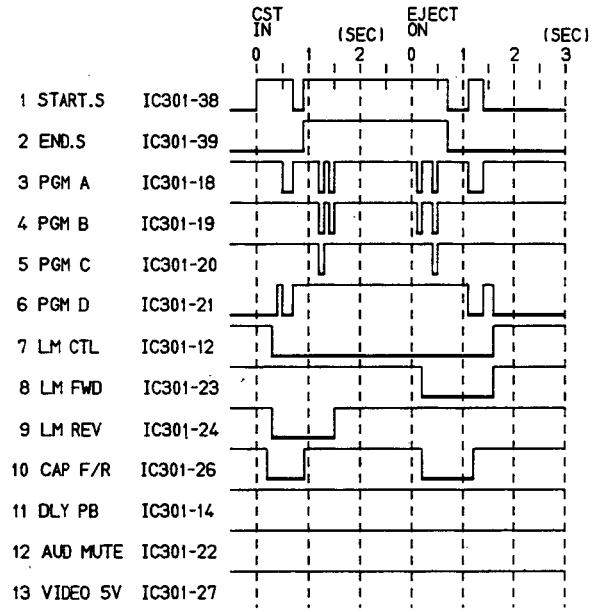


Fig. 4 CCD IN (CLAMP) Adjustment

5. TIMING CHART/TROUBLESHOOTING GUIDE

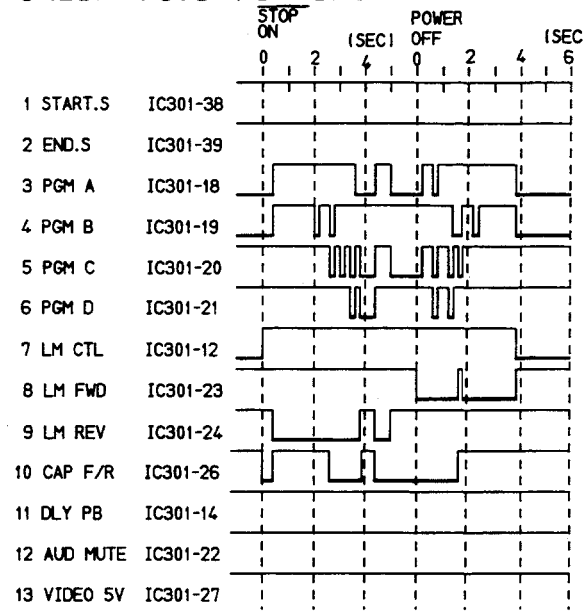
5-1. TIMING CHART

5-1-1.
EJECT / UNLOAD / EJECT



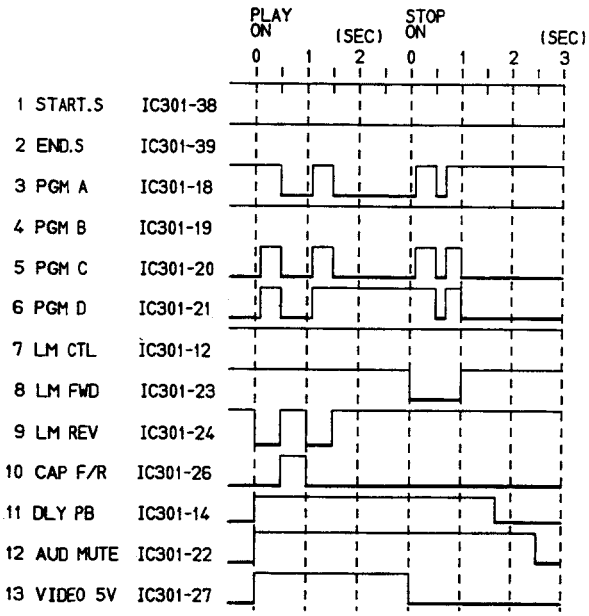
HIGH ——
LOW ——

5-1-2.
UNLOAD / STOP / UNLOAD



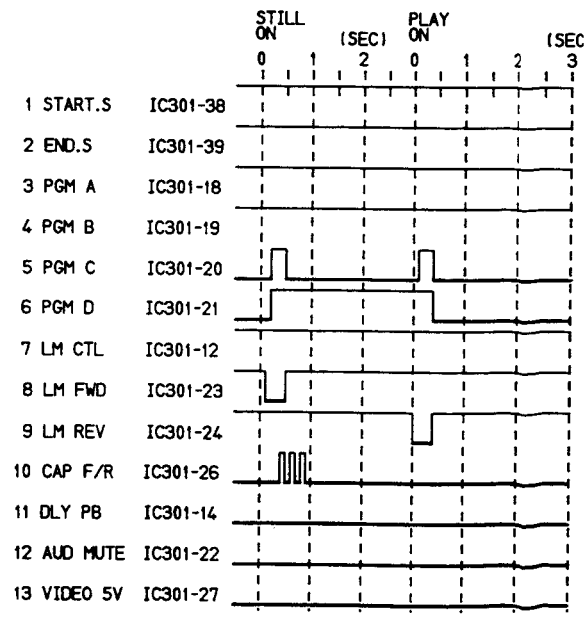
HIGH ——
LOW ——

5-1-3.
PLAY / STOP / PLAY



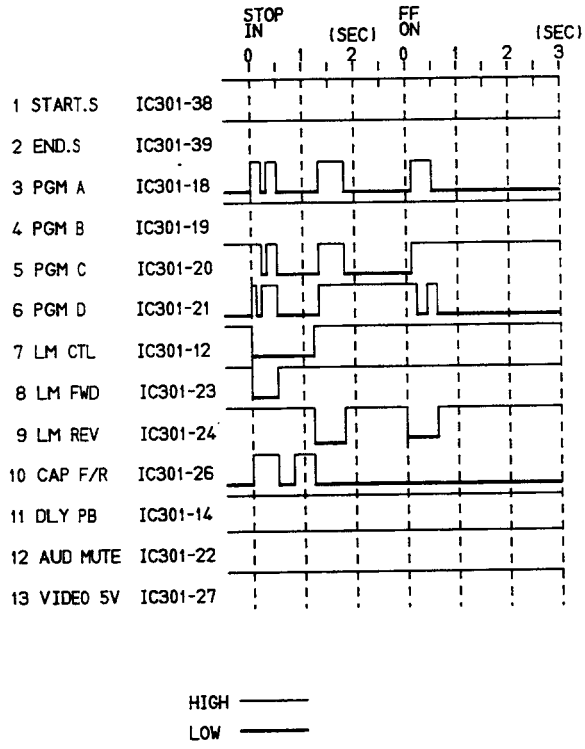
HIGH ——
LOW ——

5-1-4.
PLAY / STILL / PLAY

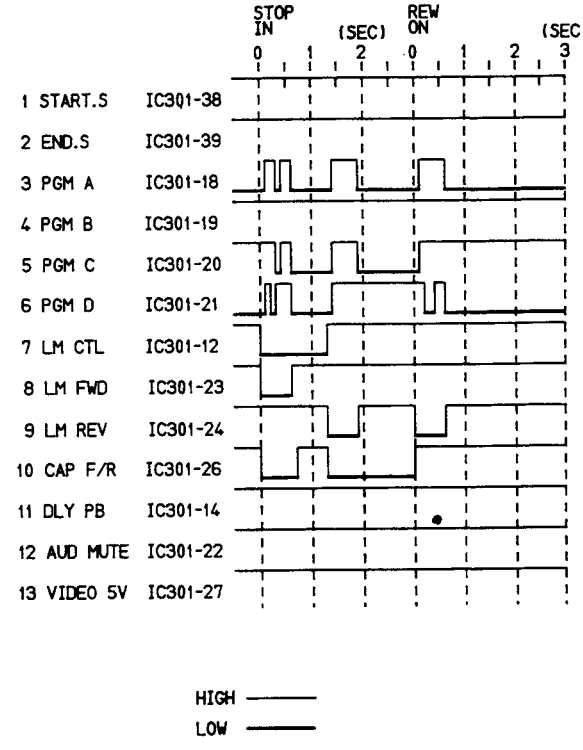


HIGH ——
LOW ——

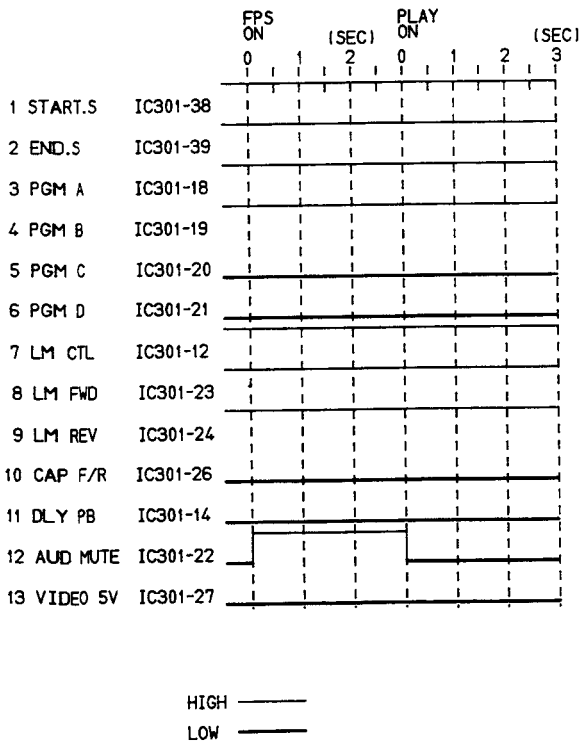
5-1-5.
FF / STOP / FF



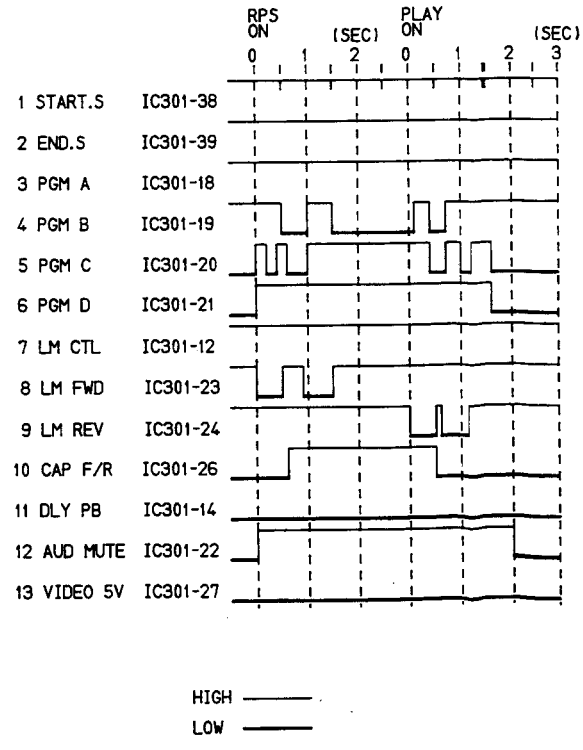
5-1-6.
REW / STOP / REW



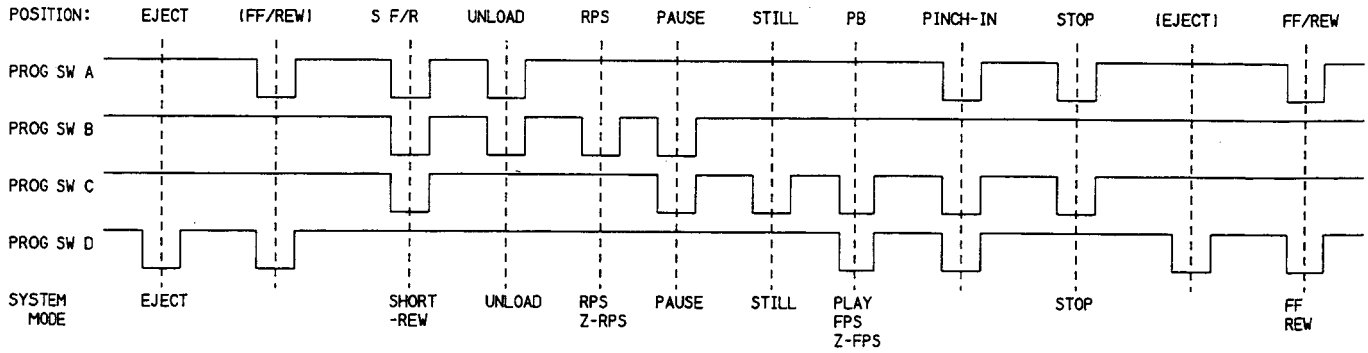
5-1-7.
PLAY / FPS / PLAY



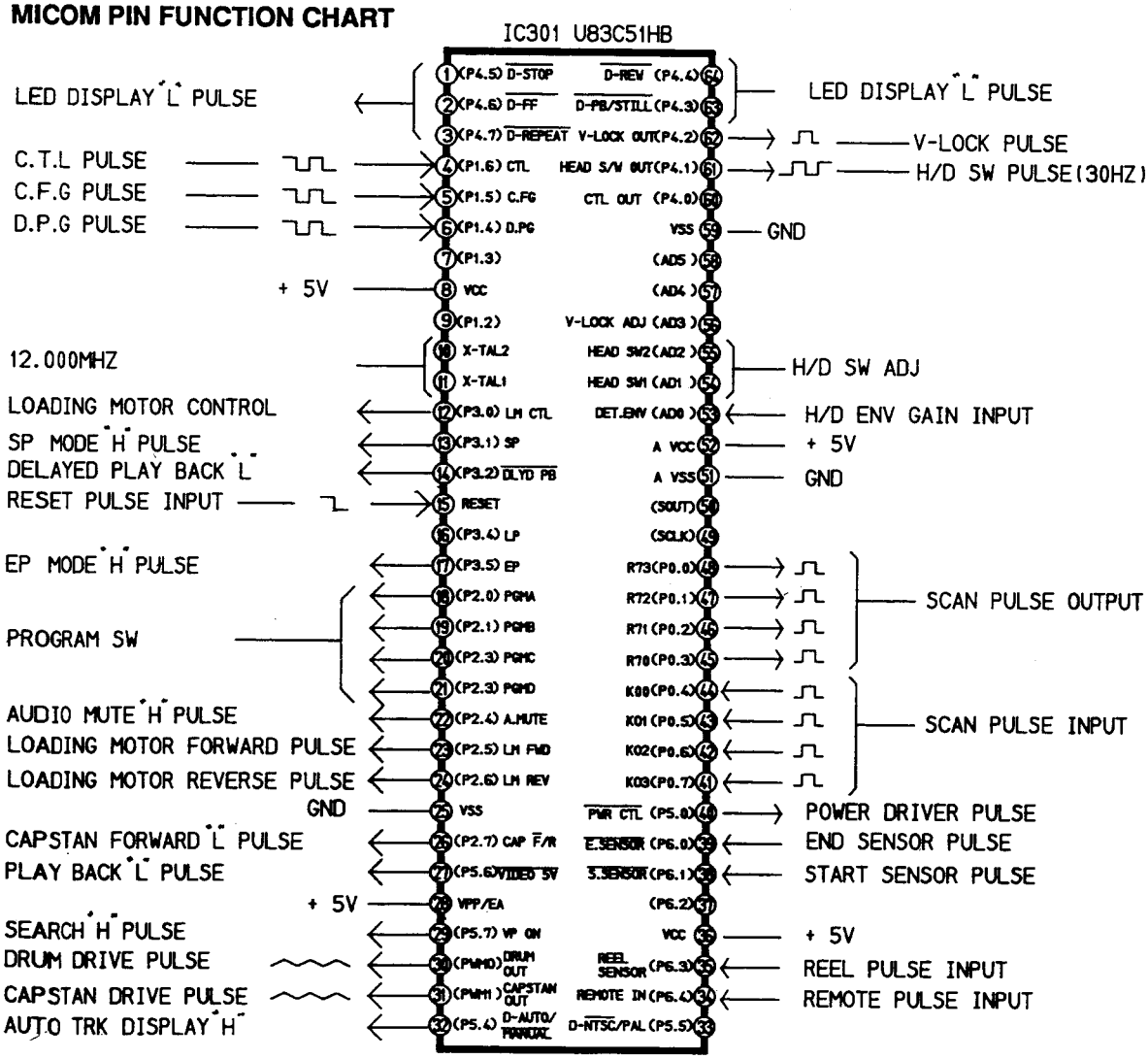
5-1-8.
PLAY / RPS / PLAY



5-1-9.
PROGRAM SWITCH TIMING CHART

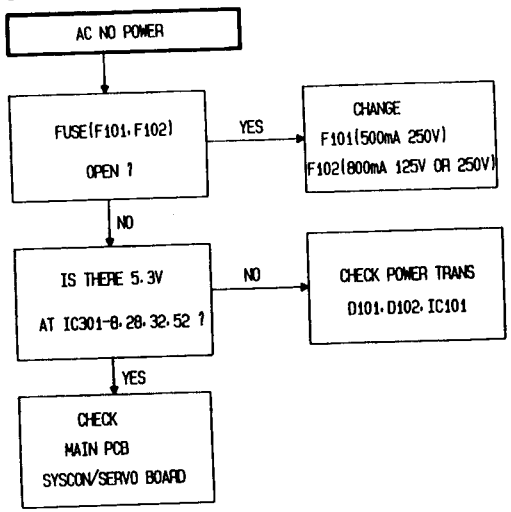


5-1-10.
MICOM PIN FUNCTION CHART

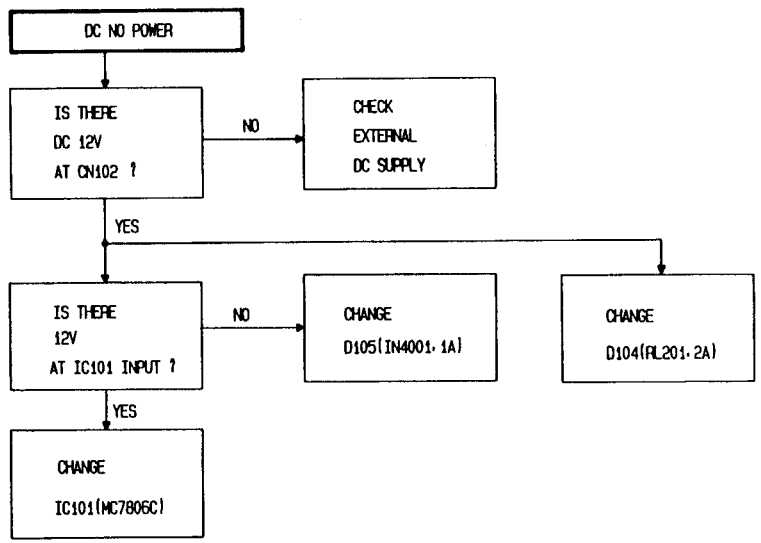


5-2. TROUBLESHOOTING GUIDE

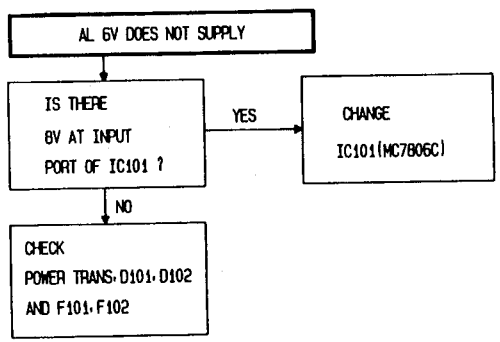
5-2-1.



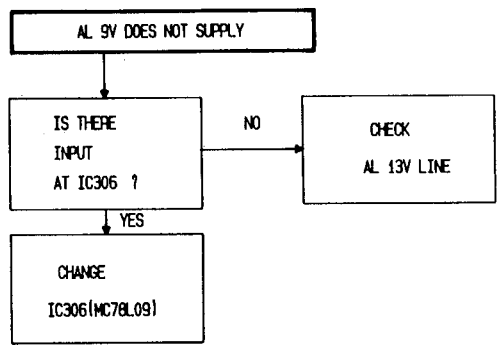
5-2-2.



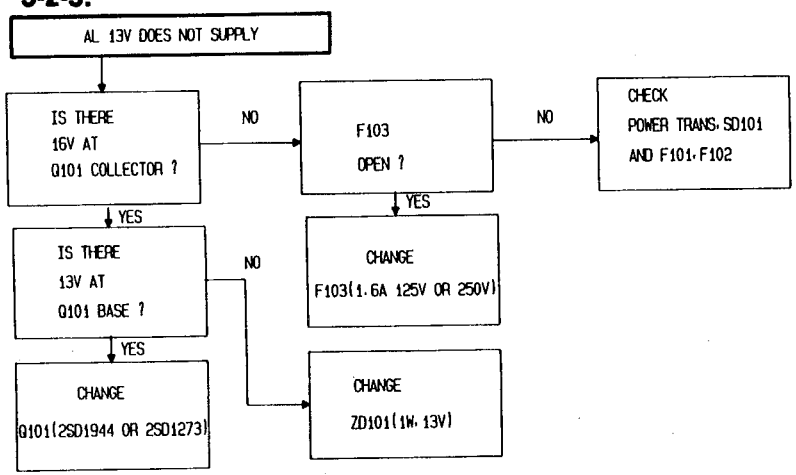
5-2-3.


AL 6V DOES NOT SUPPLY
IS THERE
8V AT INPUT
PORT OF IC101 ?
YES
CHANGE
IC101(MC7806C)
NO
CHECK
POWER TRANS, D101, D102
AND F101, F102

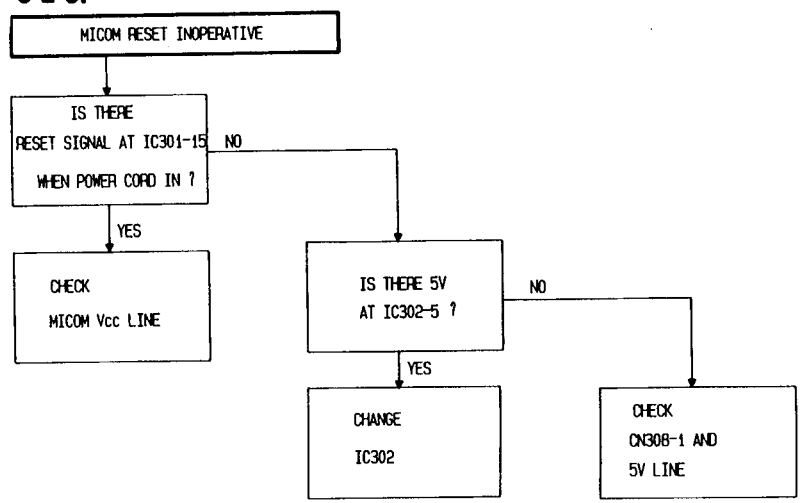
5-2-4.


AL 9V DOES NOT SUPPLY
IS THERE
INPUT
AT IC306 ?
NO
CHECK
AL 13V LINE
YES
CHANGE
IC306(MC78L09)

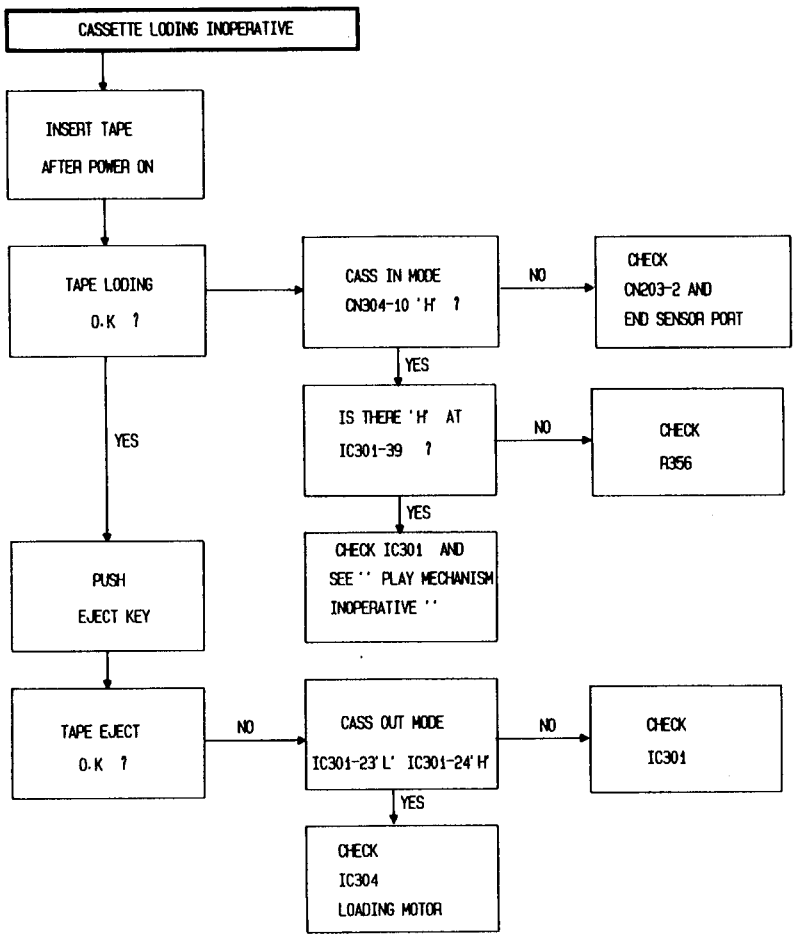
5-2-5.


AL 13V DOES NOT SUPPLY
IS THERE 16V AT Q101 COLLECTOR ?
NO
F103 OPEN ?
NO
CHECK POWER TRANS, SD101 AND F101, F102
YES
YES
IS THERE 13V AT Q101 BASE ?
NO
CHANGE F103(1.6A 125V OR 250V)
YES
CHANGE Q101(2SD1944 OR 2SD1273)
CHANGE ZD101(1W, 13V)

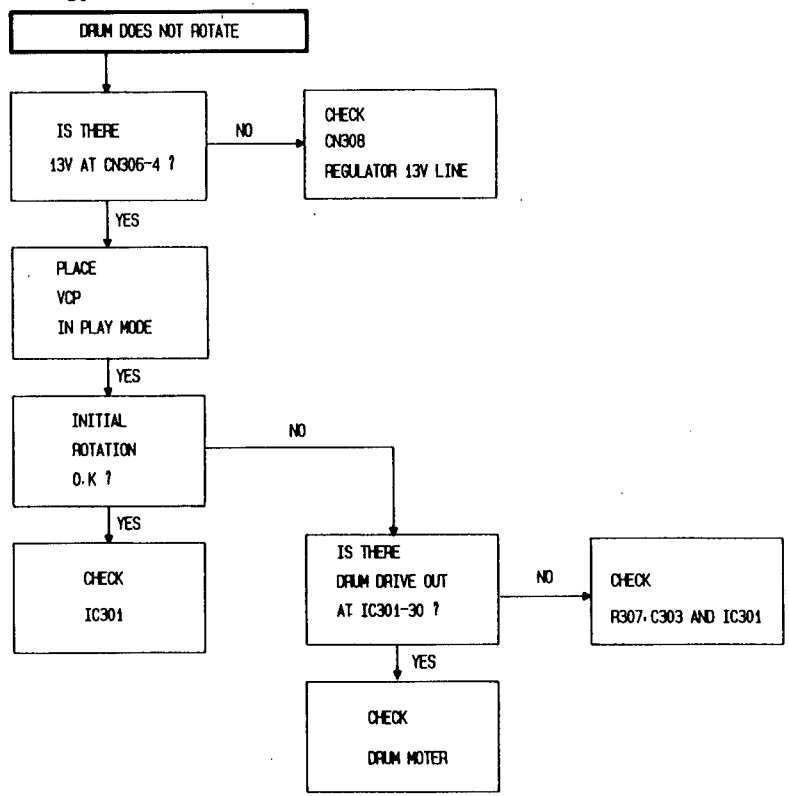
5-2-6.


MICOM RESET INOPERATIVE
IS THERE RESET SIGNAL AT IC301-15 WHEN POWER CORD IN ?
NO
YES
CHECK MICOM Vcc LINE
IS THERE 5V AT IC302-5 ?
NO
YES
CHANGE IC302
CHECK CN308-1 AND 5V LINE

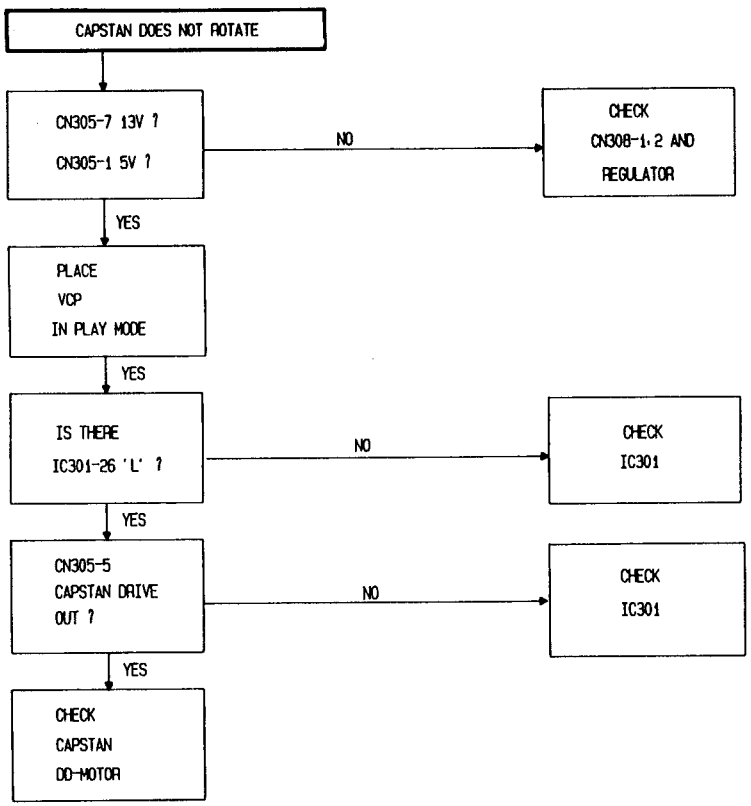
5-2-7.


CASSETTE LODING INOPERATIVE
INSERT TAPE
AFTER POWER ON
TAPE LODING
O.K ?
CASS IN MODE
CN304-10 'H' ?
NO
CHECK
CN203-2 AND
END SENSOR PORT
YES
IS THERE 'H' AT
IC301-39 ?
NO
CHECK
R356
YES
CHECK IC301 AND
SEE '' PLAY MECHANISM
INOPERATIVE ''
YES
PUSH
EJECT KEY
TAPE EJECT
O.K ?
NO
CASS OUT MODE
IC301-23'L' IC301-24'H'
NO
CHECK
IC301
YES
CHECK
IC304
LOADING MOTOR

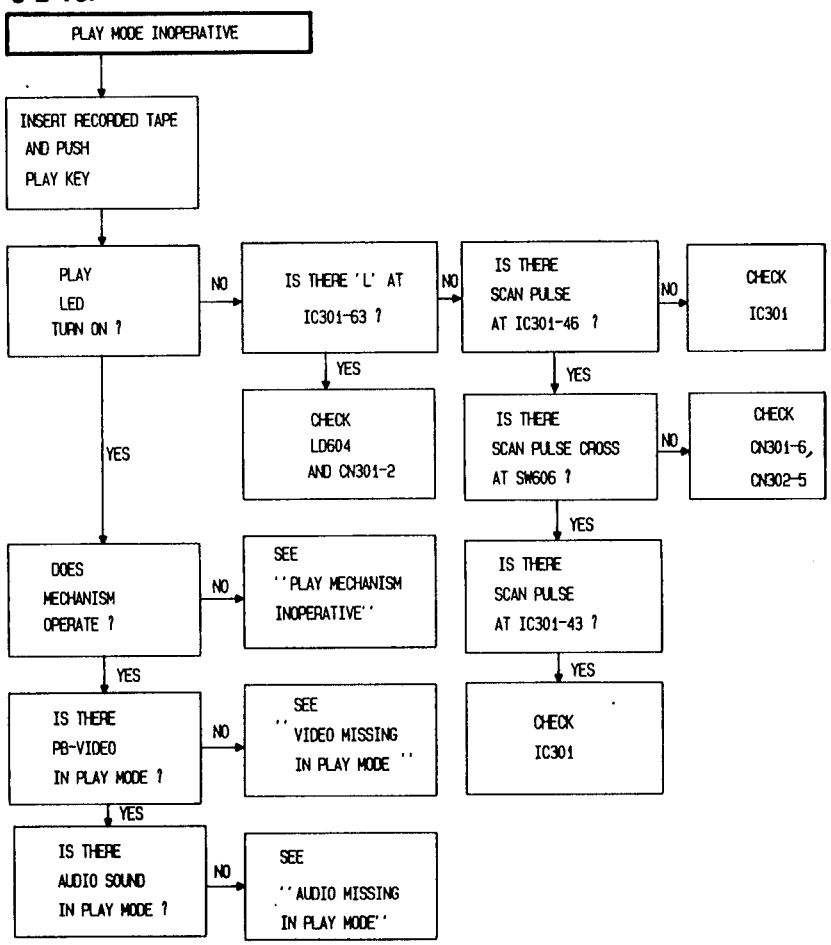
5-2-8.


DRUM DOES NOT ROTATE
IS THERE
13V AT CN306-4 ?
NO
CHECK
CN308
REGULATOR 13V LINE
YES
PLACE
VCP
IN PLAY MODE
YES
INITIAL
ROTATION
O.K ?
NO
YES
CHECK
IC301
IS THERE
DRUM DRIVE OUT
AT IC301-30 ?
NO
CHECK
R307, C303 AND IC301
YES
CHECK
DRUM MOTER

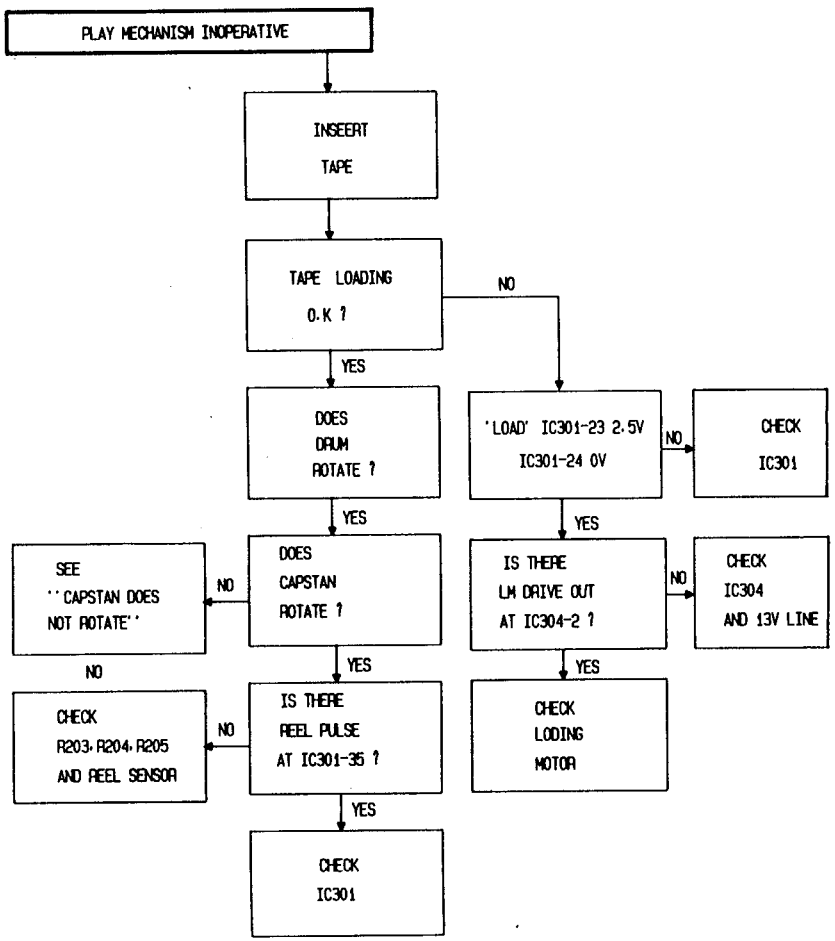
5-2-9.


CAPSTAN DOES NOT ROTATE
CN305-7 13V ?
CN305-1 5V ?
NO
CHECK
CN308-1,2 AND
REGULATOR
YES
PLACE
VCP
IN PLAY MODE
YES
IS THERE
IC301-26 'L' ?
NO
CHECK
IC301
YES
CN305-5
CAPSTAN DRIVE
OUT ?
NO
CHECK
IC301
YES
CHECK
CAPSTAN
DD-MOTOR

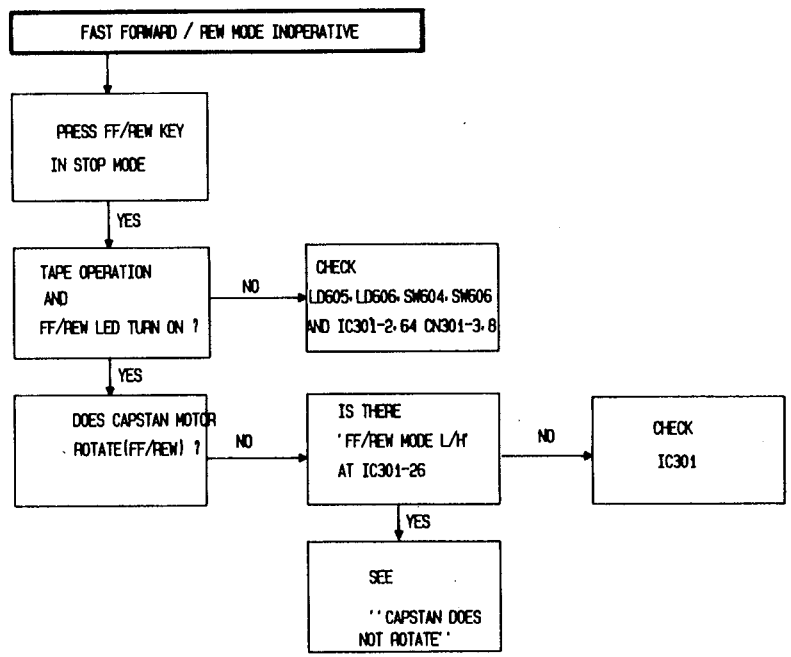
5-2-10.


PLAY MODE INOPERATIVE
INSERT RECORDED TAPE
AND PUSH
PLAY KEY
PLAY
LED
TURN ON ?
NO
IS THERE 'L' AT
IC301-63 ?
NO
IS THERE
SCAN PULSE
AT IC301-46 ?
NO
CHECK
IC301
YES
CHECK
LD604
AND CN301-2
YES
IS THERE
SCAN PULSE CROSS
AT SW606 ?
NO
CHECK
CN301-6,
CN302-5
YES
YES
DOES
MECHANISM
OPERATE ?
NO
SEE
''PLAY MECHANISM
INOPERATIVE''
YES
IS THERE
SCAN PULSE
AT IC301-43 ?
YES
IS THERE
PB-VIDEO
IN PLAY MODE ?
NO
SEE
'' VIDEO MISSING
IN PLAY MODE ''
CHECK
IC301
YES
IS THERE
AUDIO SOUND
IN PLAY MODE ?
NO
SEE
''AUDIO MISSING
IN PLAY MODE''

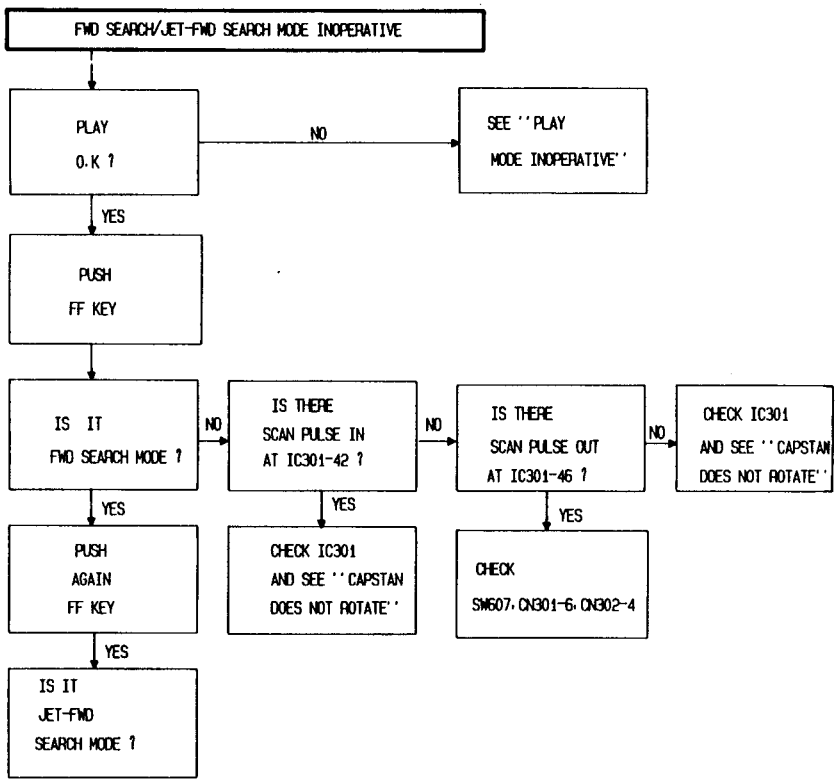
5-2-11.


PLAY MECHANISM INOPERATIVE
INSEERT TAPE
TAPE LOADING O.K ?
NO
YES
DOES DRUM ROTATE ?
'LOAD' IC301-23 2.5V IC301-24 0V
NO
CHECK IC301
YES
YES
SEE ''CAPSTAN DOES NOT ROTATE''
NO
DOES CAPSTAN ROTATE ?
IS THERE LM DRIVE OUT AT IC304-2 ?
NO
CHECK IC304 AND 13V LINE
NO
YES
YES
CHECK R203, R204, R205 AND REEL SENSOR
NO
IS THERE REEL PULSE AT IC301-35 ?
CHECK LODING MOTOR
YES
CHECK IC301

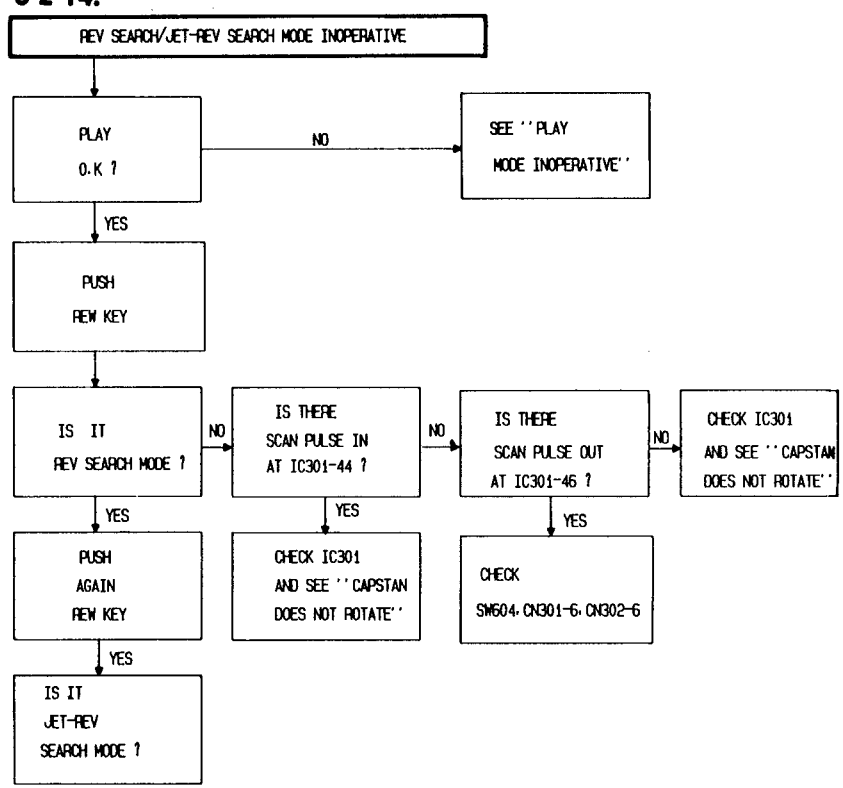
5-2-12.


FAST FORWARD / REW MODE INOPERATIVE
PRESS FF/REW KEY IN STOP MODE
YES
TAPE OPERATION AND FF/REW LED TURN ON ?
NO
CHECK LD605, LD606, SW604, SW606 AND IC301-2, 64 CN301-3, 8
YES
DOES CAPSTAN MOTOR ROTATE(FF/REW) ?
NO
IS THERE 'FF/REW MODE L/H' AT IC301-26
NO
CHECK IC301
YES
SEE ''CAPSTAN DOES NOT ROTATE''

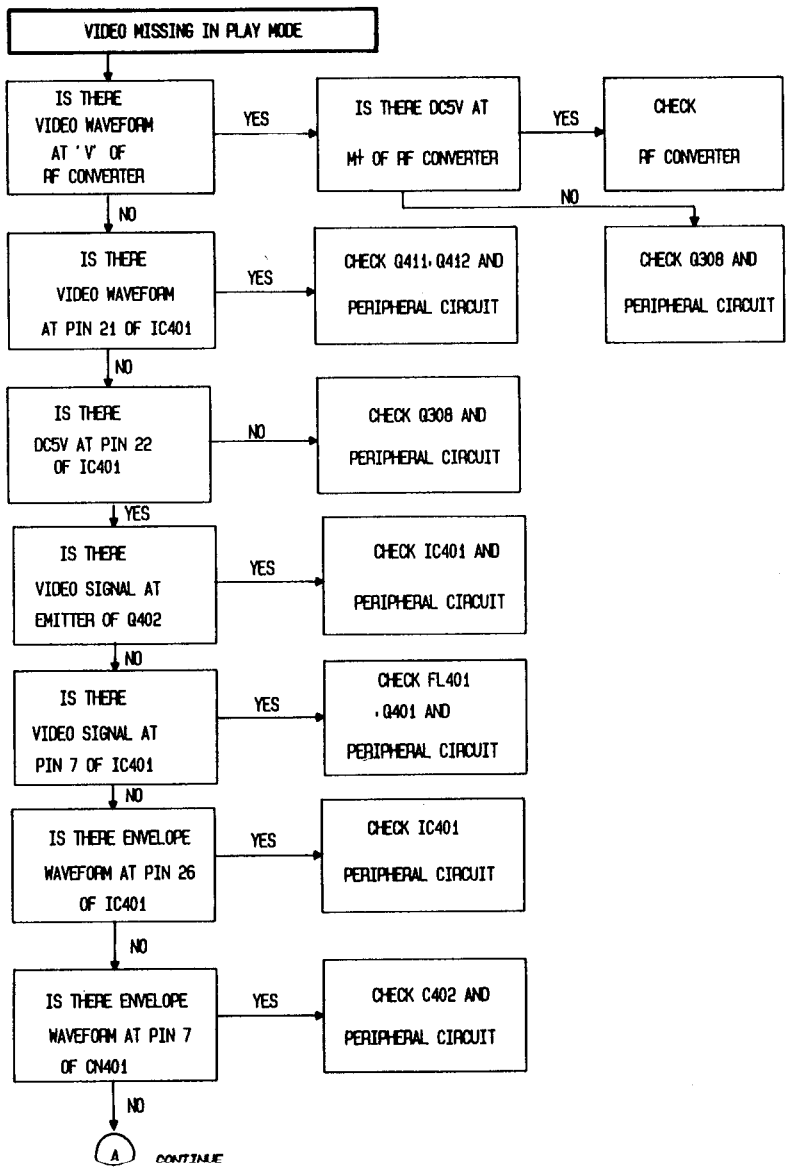
5-2-13.

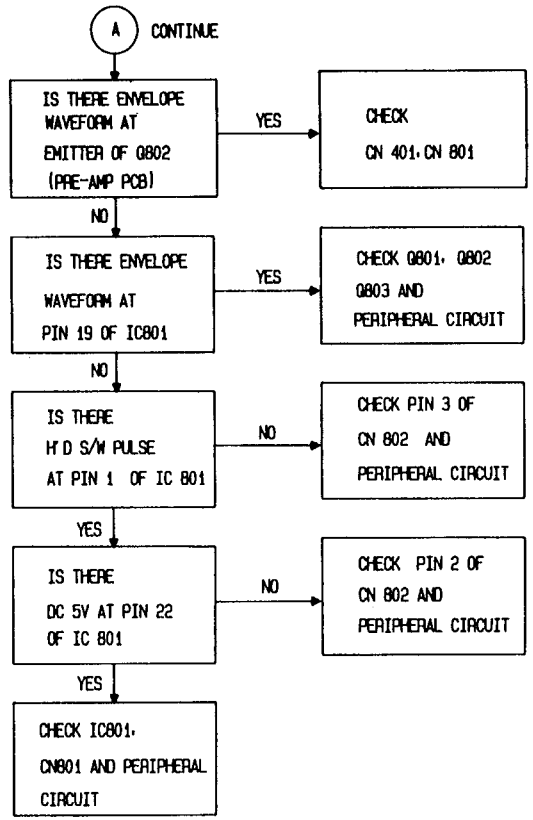

FWD SEARCH/JET-FWD SEARCH MODE INOPERATIVE
PLAY O.K ?
NO
SEE ''PLAY MODE INOPERATIVE''
YES
PUSH FF KEY
IS IT FWD SEARCH MODE ?
NO
IS THERE SCAN PULSE IN AT IC301-42 ?
NO
IS THERE SCAN PULSE OUT AT IC301-46 ?
NO
CHECK IC301 AND SEE ''CAPSTAN DOES NOT ROTATE''
YES
PUSH AGAIN FF KEY
CHECK IC301 AND SEE ''CAPSTAN DOES NOT ROTATE''
YES
CHECK SW607, CN301-6, CN302-4
YES
IS IT JET-FWD SEARCH MODE ?

5-2-14.

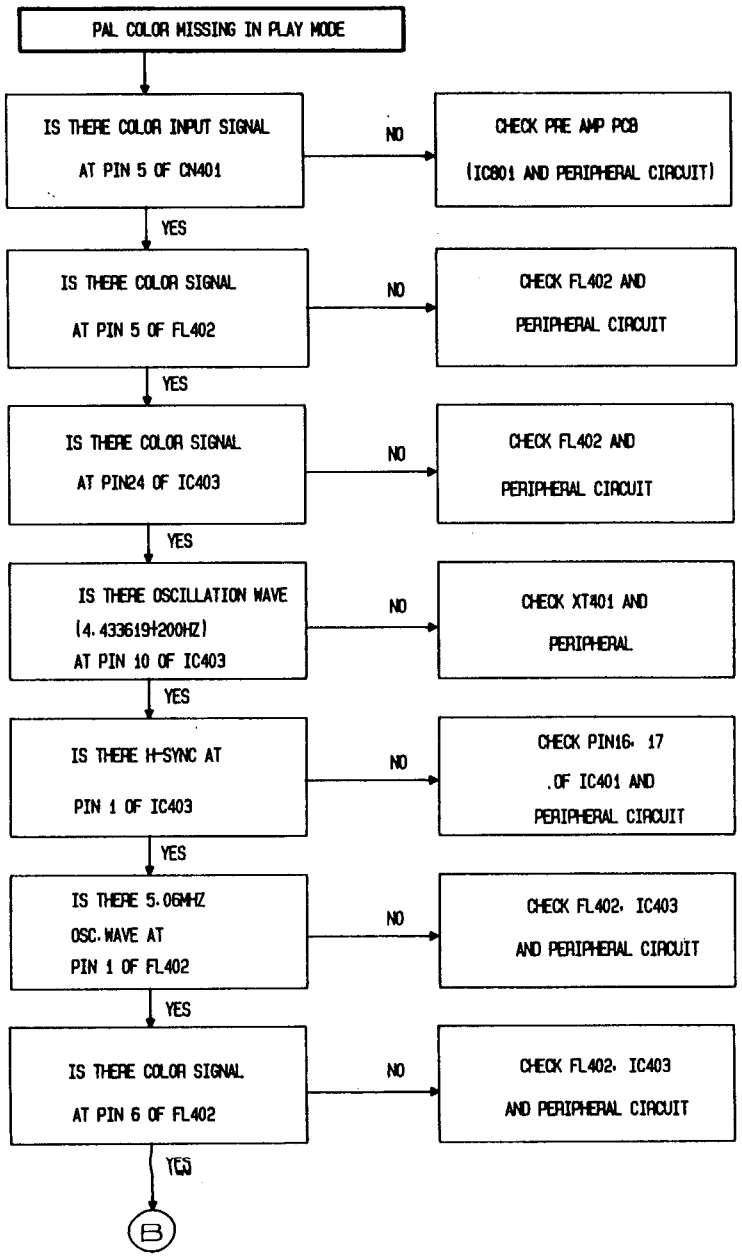

REV SEARCH/JET-REV SEARCH MODE INOPERATIVE
PLAY O.K ?
NO
SEE ''PLAY MODE INOPERATIVE''
YES
PUSH REW KEY
IS IT REV SEARCH MODE ?
NO
IS THERE SCAN PULSE IN AT IC301-44 ?
NO
IS THERE SCAN PULSE OUT AT IC301-46 ?
NO
CHECK IC301 AND SEE ''CAPSTAN DOES NOT ROTATE''
YES
PUSH AGAIN REW KEY
CHECK IC301 AND SEE ''CAPSTAN DOES NOT ROTATE''
YES
CHECK SW604, CN301-6, CN302-6
YES
IS IT JET-REV SEARCH MODE ?

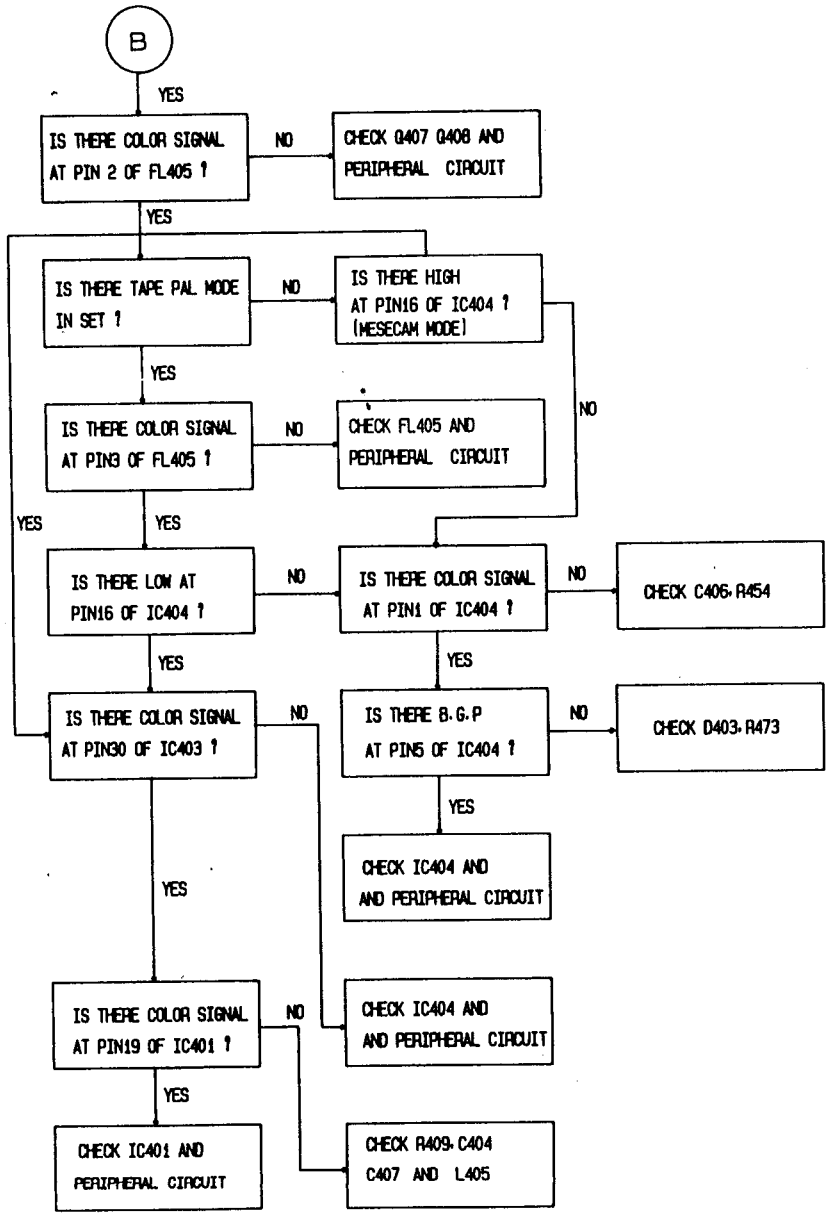
5-2-15.


VIDEO MISSING IN PLAY MODE
IS THERE VIDEO WAVEFORM AT 'V' OF RF CONVERTER
YES
IS THERE DC5V AT H+ OF RF CONVERTER
YES
CHECK RF CONVERTER
NO
NO
IS THERE VIDEO WAVEFORM AT PIN 21 OF IC401
YES
CHECK Q411, Q412 AND PERIPHERAL CIRCUIT
CHECK Q308 AND PERIPHERAL CIRCUIT
NO
IS THERE DC5V AT PIN 22 OF IC401
NO
CHECK Q308 AND PERIPHERAL CIRCUIT
YES
IS THERE VIDEO SIGNAL AT EMITTER OF Q402
YES
CHECK IC401 AND PERIPHERAL CIRCUIT
NO
IS THERE VIDEO SIGNAL AT PIN 7 OF IC401
YES
CHECK FL401 , Q401 AND PERIPHERAL CIRCUIT
NO
IS THERE ENVELOPE WAVEFORM AT PIN 26 OF IC401
YES
CHECK IC401 PERIPHERAL CIRCUIT
NO
IS THERE ENVELOPE WAVEFORM AT PIN 7 OF CN401
YES
CHECK C402 AND PERIPHERAL CIRCUIT
NO
A
CONTINUE

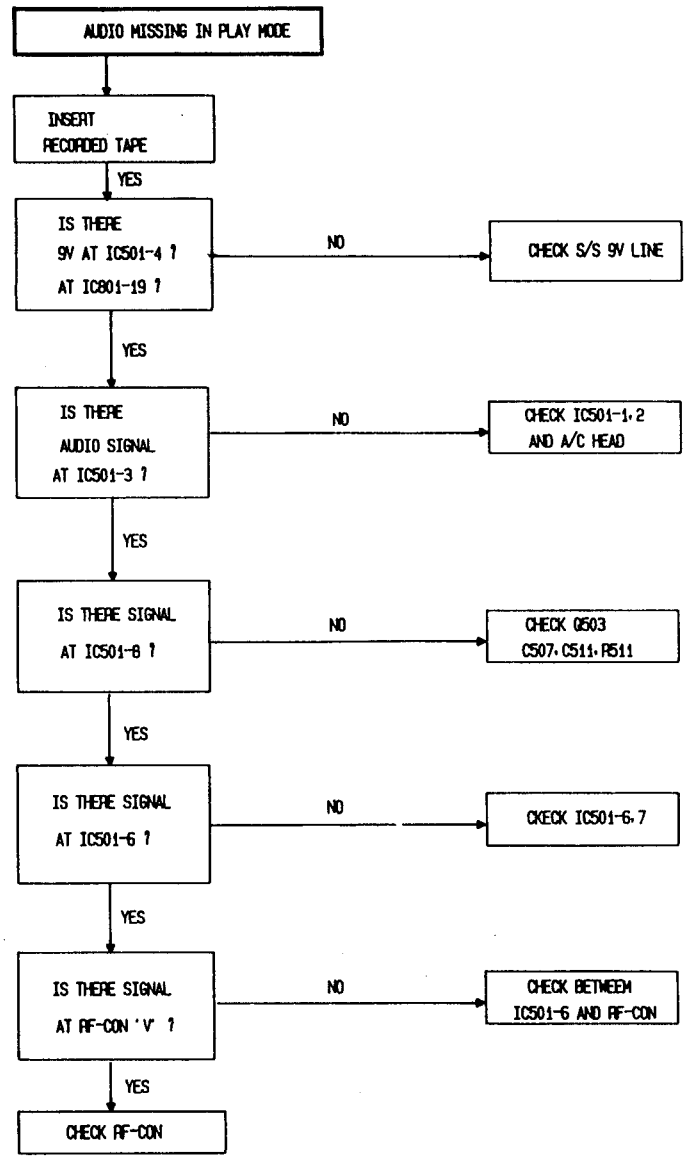

A
CONTINUE
IS THERE ENVELOPE WAVEFORM AT EMITTER OF Q802 (PRE-AMP PCB)
YES
CHECK CN 401, CN 801
NO
IS THERE ENVELOPE WAVEFORM AT PIN 19 OF IC801
YES
CHECK Q801, Q802 Q803 AND PERIPHERAL CIRCUIT
NO
IS THERE H'D S/W PULSE AT PIN 1 OF IC 801
NO
CHECK PIN 3 OF CN 802 AND PERIPHERAL CIRCUIT
YES
IS THERE DC 5V AT PIN 22 OF IC 801
NO
CHECK PIN 2 OF CN 802 AND PERIPHERAL CIRCUIT
YES
CHECK IC801, CN801 AND PERIPHERAL CIRCUIT

5-2-16.


PAL COLOR MISSING IN PLAY MODE
IS THERE COLOR INPUT SIGNAL AT PIN 5 OF CN401
NO
CHECK PRE AMP PCB (IC801 AND PERIPHERAL CIRCUIT)
YES
IS THERE COLOR SIGNAL AT PIN 5 OF FL402
NO
CHECK FL402 AND PERIPHERAL CIRCUIT
YES
IS THERE COLOR SIGNAL AT PIN24 OF IC403
NO
CHECK FL402 AND PERIPHERAL CIRCUIT
YES
IS THERE OSCILLATION WAVE (4.433619±200HZ) AT PIN 10 OF IC403
NO
CHECK XT401 AND PERIPHERAL
YES
IS THERE H-SYNC AT PIN 1 OF IC403
NO
CHECK PIN16, 17 .OF IC401 AND PERIPHERAL CIRCUIT
YES
IS THERE 5.06MHZ OSC. WAVE AT PIN 1 OF FL402
NO
CHECK FL402, IC403 AND PERIPHERAL CIRCUIT
YES
IS THERE COLOR SIGNAL AT PIN 6 OF FL402
NO
CHECK FL402, IC403 AND PERIPHERAL CIRCUIT
YES
B


B
YES
IS THERE COLOR SIGNAL AT PIN 2 OF FL405 ?
NO
CHECK Q407 Q408 AND PERIPHERAL CIRCUIT
YES
IS THERE TAPE PAL MODE IN SET ?
NO
IS THERE HIGH AT PIN16 OF IC404 ? (MESECAM MODE)
YES
IS THERE COLOR SIGNAL AT PIN3 OF FL405 ?
NO
CHECK FL405 AND PERIPHERAL CIRCUIT
YES
IS THERE LOW AT PIN16 OF IC404 ?
NO
IS THERE COLOR SIGNAL AT PIN1 OF IC404 ?
NO
CHECK C406, R454
YES
IS THERE COLOR SIGNAL AT PIN30 OF IC403 ?
NO
IS THERE B.G.P AT PIN5 OF IC404 ?
NO
CHECK D403, R473
YES
CHECK IC404 AND AND PERIPHERAL CIRCUIT
YES
IS THERE COLOR SIGNAL AT PIN19 OF IC401 ?
NO
CHECK IC404 AND AND PERIPHERAL CIRCUIT
YES
CHECK IC401 AND PERIPHERAL CIRCUIT
CHECK R409, C404 C407 AND L405

5-2-17.


AUDIO MISSING IN PLAY MODE
INSERT RECORDED TAPE
YES
IS THERE 9V AT IC501-4 ? AT IC801-19 ?
NO
CHECK S/S 9V LINE
YES
IS THERE AUDIO SIGNAL AT IC501-3 ?
NO
CHECK IC501-1,2 AND A/C HEAD
YES
IS THERE SIGNAL AT IC501-8 ?
NO
CHECK Q503 C507,C511,R511
YES
IS THERE SIGNAL AT IC501-6 ?
NO
CKECK IC501-6,7
YES
IS THERE SIGNAL AT RF-CON 'V' ?
NO
CHECK BETWEEN IC501-6 AND RF-CON
YES
CHECK RF-CON

6. REPLACEMENT PARTS LIST

1. Parts Replacement

Many electrical and mechanical parts in video cassette recorder(player) have special safety-related characteristics. These are after not evident from visual inspection nor the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual ; electrical components having such features are identified by ⚠ in the replacement parts lists and schematic diagrams.
The use of a substitute replacement part which does not have the same safety characteristics as the factory recommanded replacement parts shown in this service manual may create shock, fire or other hazard.

2. Unless otherwise specified :

1) All resistors are in ohms (Ω)
- K=1,000
- M=1,000K

*** RD** : 1/8W, +/- 5% Carbon

*** RM** : 1/4W, +/- 5% Metal-film

2) All capacitors are in +/- 10%, MF = uF.

*** CC** : PF = uuF, Ceramic, Temp

*** CK** : PK = uuF, Ceramic, MK

*** CS** : Tantalium

*** CQ** : Polyester

*** CE** : Electrolytic

3) All coils are in microhenries (uH), M = 1,000uH.

3. ASS'Y = Assembly.

4. P . W . B = Printed Wiring Board.

5. ⚠ Mark : Safety related parts.

6. How to order replacement parts

To have your order filed promptly and correctly, please furnish the following informations.

1) Model Number

2) Location Number

3) Part Number

4) Description & Specification

7. P . W . B Assembly is not Replacement Item.

6-1. MECHANICAL REPLACEMENT PARTS LIST

LOCA.NO	PART-NUMBER	DESCRIPTION;SPECIFICATION	REMARK
		INSTRUMENT ASSEMBLY	
1	69000-212-005	ASS'Y-PANEL FRONT ; PX-990R/SEG	
	69000-213-050	ASS'Y-PANEL FRONT ; PX-991R/SEG	
	69000-214-051	ASS'Y-PANEL FRONT ; PX-992R/SEG	
122	69097-415-501	REGULATOR ASS'Y ; P-5 230V(DC12V) CP2	
125	63334-010-036	DC JACK ASS'Y ; P-5 DIN TYPE	
130	66020-602-710	FRAME ; HIPS 94H8 (P-5)	
132	66612-607-110	BOTTOM COVER ; SPG T0.5 720 COIL	
135	62569-002-266	RF-CONVERTER ; RMUP 23655FA	
137	69557-603-202	ASS'Y MAIN A ; P-5 PAL MESECAM	
139	69552-601-201	ASS'Y MAIN B ; P-5 PAL MESECAM	
143	66634-602-610	CLAMPER WIRE ; PE BLK	
151	69370-601-202	ASS'Y FUNCTION ; PX-990R	
	69570-603-202	ASS'Y FUNCTION ; PX-991R	
	69570-603-203	ASS'Y FUNCTION ; PX-992R	
163	66002-604-710	TOP CABINET ; PVC STEEL T0.75 DARK GRAY	
167	66463-605-210	CONNECTOR-BOARD ; HIPS 94H8 (PAL UHF)	
183	67108-330-061	SCREW-TAP.PWH ; M3X6 TAP TITE	
190	67158-240-121	SCREW BH ; 2-4X12 FE FZY	
193	67158-240-103	SCREW-TAP BH ; 2S-4X10FE FZB	
200	DX1-NB2	FULL DECK ASS'Y ; P-5	
454	69512-603-202	ASS'Y PRE-AMP ; P-5 PAL MESECAM	
533	67642-603-825	DOOR HOUSING ; ACRYL	
		TRANPORT MECHANISM ASSEMBLY	
T202	65224-606-220	CAP(NO.8 GUIDE);DURACON M90-44	
T203	69000-290-220	ASSY LED(R);DX1-NR2	
T206	69000-280-244	G/R & P/B ASSY "R" ;X-1	
T207	69000-280-242	G/R & P/B ASSY "L" ; X-1	
T209	65292-600-620	LOADING UNIT ASSY;POM+SUS+SECC	
T209-1	64769-052-140	MOTOR-LOADING;RF-370C-15370	
T209-2	63579-101-026	SW-PROGRAM;SRZZ-S-092(X-1)	
T209-3	65204-613-310	GEAR WORM;PBT(DURANEX #2002)	
T213	65203-604-910	WORM GEAR WHEEL;POM(X-1)	
T214	65203-605-010	E/T DRIVE GEAR;PBT(X-1)	
T215	65241-600-010	MASTER CAM GEAR;POM(X-1)	
T216	66613-610-710	E/J DRIVE BRKT;SECC T1.2	
T217	66674-639-210	S/P EJECT DRIVE;SWP8	
T219	65253-611-610	PINCH ROLLER LEVER ASS'Y	
T220	65263-601-030	BRAKE LEVER CAM ASS'Y;SECC 20/20+SUM	
T221	65234-602-610	REEL DISK "L" ASS'Y;POM+SUS	
T222	65234-602-620	REEL DISK "R" ASS'Y;POM+PO CYSETER	
T228	65254-626-510	BRAKE SUB "R" ASS'Y;X-1	
T229	66603-612-810	BRAKE SUB "L" ;POM	
T233	66054-609-410	IDLER SUB ASSY;(X-1)	
T235	65253-609-010	TENSION ARM ASS'Y;SECC+POM+SUS	
T236	65274-603-110	TENSION BAND ASS'Y;POM+FELT+LUMIRROR	
T237	66674-640-510	TENSION SPRING;SUS304-WP8	
T238	65263-600-810	REVIEW ARM ASS'Y;SECC 20/20+SUS	
T239	66674-639-020	S/P REVIEW ARM;SUS304-WP8 P10.55	
T240	67224-602-011	NYLON NUT;M3 X 4.5 NYLON 66 + SWR	
T242	69000-290-230	ASSY-PCB JOINT(R);DX1-NR2	
T252	66674-640-920	SPRING TORSION A/C;SWP8 (NI)	
T253	67224-602-011	NYLON NUT;M3 X 4.5 NYLON 66 + SWR	
T254	67224-602-210	CAM ADJUST;ALLOY 5	
T255	69000-290-260	ASSY-A/C HEAD(R);DX1-NR2	
T256	64079-700-595	HEAD MAGNETIC F/E;VTR-1X2ERS11-092	
T300	69019-123-140	CYLINDER ASS'Y ; CX1-P2N	
T301	69000-390-271	ASSY-UPPER CYLINDER;CX1-P2N	
T302	63005-701-075	PW8-UPPER CYLINDER ; 94VO 47X47X1.0T	
T303	69000-390-022	ASSY-LOWER CYLINDER;CX1S2/AS	
T304	67223-600-110	HOLDER TR ASSY;ZDC+SUS301 CSP T0.2	
T305	69000-390-061	SEMI ASSY-MOTOR(U);CX1	
T306	66121-601-210	CYLINDER-BASE;ADC 12(X-1)	
906	67008-130-061	SCREW-PH;+M3X6 FE FZY	
907	67004-100-710	SCREW-PH;+M3X4 FE FZY	
909	67008-126-081	SCREW-PH;+M2.6X8 FE FZY	
910	67008-126-041	SCREW-BH;+M2.6X5 FE FZY	
912	67094-604-710	SCREW-DAMPER ; M2. 0X7.0 SWCM 10	
913	67008-123-101	SCREW-PH;+M2.3X10 FE FZY	
916	67004-126-086	SCREW-BH;+M2.6X8 WSZN/70391398	
917	67004-100-310	SCREW-PH;+M3X8 FE FZY WL	
922	67108-526-243	SCREW-TAP.PH;2S-3X8 FE FZY	
956	67304-103-410	WASHER-PLAIN;3.2X6X0.5 POLYSLIDER	
957	67334-600-310	WASHER SLIT;PI2.5XPI5XT0.5	
961	67304-602-610	WASHER SLIT;PI3.6XPI12XT0.5 LUMIRROR	
CN202	63053-916-297	LEAD CON ASSY;1429 #26 PHR-06 1L-M-6P-SA	
		BOTTOM SIDE MECHANISM ASSEMBLY	
B204	65264-606-510	LOADING GEAR "L"ASS'Y ; X-1	
B205	65264-606-610	LOADING GEAR "R"ASS'Y ; X-1	
B208	65263-601-110	SECTOR GEAR ASS'Y;SECC+SUM	
B223	65254-626-210	MAIN BRAKE "L" ASS'Y ; X-1	
B224	65254-626-310	MAIN BRAKE "R" ASS'Y ; X-1	
B225	66674-640-710	S/P SUB "R" ; SWP8(BLK)	

LOCA.NO	PART-NUMBER	DESCRIPTION;SPECIFICATION	REMARK
B226	66674-640-810	S/P SUB "L" ; SUS 304 WP8	
B227	66674-642-710	S/P MAIN SLIDE;SWP8(YEL)	
B230	65252-600-910	MAIN BRAKE SLIDE ASS'Y;P8T+SUS	
B231	65253-609-210	LEVER SHIFT;POM	
B232	65294-602-310	TENSION CONTROL LEVER;POM	
B234	66053-604-410	CLUTCH ASS'Y;(X-1)	
B241	66614-625-010	HEAD BRUSH ASSY;SECC T1.0+CARBON TIP	
B243	63054-309-110	SUMI-CARD;P1.25 9P 180m/m	
B246	69000-290-240	ASSY-REEL PCB(R);DX1-NR2	
B247	64769-052-236	MOTOR D.D CAPSTAN;F2QKB89(X-1)	
B248	65254-626-020	D.D BRAKE ASS'Y;P8T+FELT	
B249	65274-603-210	CAPSTAN BELT;CY65(X-1)	
B250	66674-638-820	D.D CAPSTAN S/P;SUS 304(X-1)	
B257	66674-646-910	GROUND PLATE BOTTOM;SUS 430 T0.3	
B258	63579-101-027	SW-RECORD;SPPB-S-061	
B259	66604-633-710	STOPPER P/I;POM.	
907	67004-100-710	SCREW-PH;+M3X4 FE FZY	
920	67128-520-203	SCREW-TAPTITE PWH;M2.6X6 FE FZY	
922	67108-526-243	SCREW-TAP.PH;2S-3X8 FE FZY	
956	67304-103-410	WASHER-PLAIN;3.2X6X0.5 POLYSLIDER	
957	67334-600-310	WASHER SLIT;PI2.5XPI5XT0.5	
961	67304-602-610	WASHER SLIT;PI3.6XPI12XT0.5 LUMIRROR(RED	
CN6204	63053-804-128	LEAD CONNECTOR ASSY#26 51004-51004 4P	
Q6202	62309-110-244	PHOTO INTERRUPTER;NJL5165K	
H500	66122-700-630	F/L HOUSING ASS'Y ; HF-X	
H501	66151-602-210	UPPER CHASSIS;SECC 20/20 T=1.0**	
H502	66461-600-120	GUIDE CASSETTE;ABS(GP-2200)BLK	
H503	69000-470-610	SIDE CHASSIS(L)ASS'Y;ABS+POM	
H504	69000-470-690	SIDE CHASSIS "R" ASS'Y;ABS+POM+SECC	
H552	69000-470-620	ASS'Y CASS HOLDER;SECC+POM+SUS	
H553	69000-470-660	PW8 SENSOR ASSY;PW8+TR+WIRE	
H556	69000-470-650	ASSY-SIDE ARM;SUM+POM+DURCON	
H561	65253-608-510	MASK CAM LEVER;POM(M90-44)	
H562	65204-613-510	LIGHT SHUTTER;POM(M90-44)	
H563	66674-639-820	S/P LIGHT SHUTTER;SUS 304 WP8	
H564	66133-600-410	EARTH PLATE ; SUS304 T=0.25	
H565	66674-639-310	S/P ARM TORSION	
H573	65203-605-310	JOINT GEAR;POM(WHT)	
H574	65253-605-310	EJECT SLIDE;SECC 20/20 T=1.6	
924	67154-101-420	SCREW-TAP PWH ; 2S-3X8 FE FZY	
C6202	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C6203	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
Q6203	62309-110-510	PHOTO TR;RPM-20DB	
Q6204	62309-110-510	PHOTO TR;RPM-20DB	
T242	69000-290-231	ASSY P.C.B JOINT(R);DX1-NB2	
CN201	63349-062-400	CONNECTOR-WAFER;5267-11A	
CN202	63349-604-140	CONNECTOR WAFER;53014-0410	
CN203	63349-604-130	CONNECTOR WAFER;53014-0310	
CN204	63053-208-106	LEAD CONNECTOR ASSY;1429 #26 51004-5295	
Q201	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
R201	61048-177-155	R-METAL FILM;RM 1/8TS 1.5M-J	
R202	61048-177-155	R-METAL FILM;RM 1/8TS 1.5M-J	
R203	61048-177-391	R-METAL FILM;RM 1/8TS 390-J	
R204	61048-177-224	R-METAL FILM;RM 1/8TS 220K-J	
R205	61048-177-103	R-METAL FILM;RM 1/8TS 10K-J	
R206	61048-177-124	R-METAL FILM;RM 1/8TS 120K-J	
R207	61048-177-224	R-METAL FILM;RM 1/8TS 220K-J	

6-2. ELECTRICAL REPLACEMENT PARTS LIST

LOCA.NO	PART-NUMBER	DESCRIPTION;SPECIFICATION	REMARK
122	69097-415-501	REGULATOR ASSY;P-5 230V(DC12V) CP2 EUROPE	
	62869-190-289	POWER TRANSFORMER;66X20 S 230V 50HZ	
	63053-811-221	POWER CORD ASSY;KLCE-2F CP-2	
C101	61407-117-228	C-CERAMIC.AXIAL;CAX SL TAPG 50V 223-Z	
C102	61407-117-228	C-CERAMIC.AXIAL;CAX SL TAPG 50V 223-Z	
C103	61639-205-472	C-ELEC;CE 25V 4700M SA (18X40)	
C104	61639-906-222	C-ELEC;LC-1631-2200-35-M	
C105	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C106	61637-506-470	C-ELEC;CEAP 35V 47M SG(6.3X11)	
CN101	63349-062-520	CONNECTOR-WAFER;5268-03A	
CN102	63349-062-540	CONNECTOR-WAFER;5268-05A	
D101	62169-201-050	DIODE;1N4001 TAPG	
D102	62169-201-050	DIODE;1N4001 TAPG	
D103	62169-201-050	DIODE;1N4001 TAPG	
D104	62169-407-068	DIODE;RL201(2A)	
D105	62169-407-068	DIODE;RL201(2A)	
F101	64079-084-035	FUSE;5X20M/M T200MA 250V	
F102	64709-084-810	FUSE;T1.6A 250V T19195 5X20mm WIC EUR	
IC101	62119-108-019	IC;MC 7806C	
LC101	61469-502-010	C-CERAMIC DISK;CS17-E2GA 472 MYAS	
LF101	62429-014-115	LINE-FILTER;HL38	
Q101	62139-301-308	TRANSISTOR;2SD 1944/2SD1273	
R102	61049-311-080	R-METAL OXIDE;RS 1/2P 330-J	
SD101	62169-403-562	DIODE-STACK;RBV402	
ZD101	62169-403-839	DIODE ZENER;UZP-13B(1W 13V)	
	69099-611-150	ASSY REMOCON;P-5 PB BASIC	
	67642-602-510	DOOR BATTERY;ABS 94HB	
C001	61637-203-470	C-ELEC;CEAP 10V 47M SA(5X11)	
C002	61409-101-360	C-CERAMIC.TEMP;CC45 SL 50V 100-J	
C003	61409-101-360	C-CERAMIC.TEMP;CC45 SL 50V 100-J	
C004	61409-101-360	C-CERAMIC.TEMP;CC45 SL 50V 100-J	
D001	62169-406-482	DIODE;1N4148 SAMSUNG	
D002	62169-406-482	DIODE;1N4148 SAMSUNG	
D003	62169-406-482	DIODE;1N4148 SAMSUNG	
D004	62169-406-482	DIODE;1N4148 SAMSUNG	
D005	62169-406-482	DIODE;1N4148 SAMSUNG	
D006	62169-406-482	DIODE;1N4148 SAMSUNG	
IC001	62119-401-920	IC;M50560-155P	
LD001	62309-112-021	LED-IR;SSIR-5C	
Q001	62149-301-431	TRANSISTOR;KSC 1008-Y	
R001	61048-177-109	R-METAL FILM;RM 1/8TS 1-J	
XT001	64539-102-311	CERAMIC RESONATOR;CSB 455 EBL	
205		ASS'Y FUNCTION	
	69370-601-202	ASSY FUNCTION ; PX-990R	
	69570-603-202	ASSY FUNCTION ; PX-991R	
	69570-603-203	ASSY FUNCTION ; PX-992R	
C601	61637-504-101	C-ELEC;CEAP 16V 100M SG(6.3X11)	
C602	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
CN601	63053-609-880	LEAD CONVERTOR ASSY;1429/1061 #26	
CN602	63053-110-118	LEAD CONNECTOR ASSY;1429 #26	
D601	62169-406-482	DIODE;1N4148 SAMSUNG	
D602	62169-406-482	DIODE;1N4148 SAMSUNG	
D603	62169-406-482	DIODE;1N4148 SAMSUNG	
D604	62169-406-482	DIODE;1N4148 SAMSUNG	
LD601	62309-110-340	LED;GL-3HD7/GL3HD8	
LD602	62309-110-350	LED;GL-3EG7/GL-3EG8	
LD603	62309-110-350	LED;GL-3EG7/GL-3EG8	
LD604	62309-110-350	LED;GL-3EG7/GL-3EG8	
LD605	62309-110-350	LED;GL-3EG7/GL-3EG8	
LD606	62309-110-350	LED;GL-3EG7/GL-3EG8	
LD607	62309-110-350	LED;GL-3EG7/GL-3EG8	
R601	61048-177-182	R-METAL FILM;RM 1/8TS 1.8K-J	
R602	61048-177-151	R-METAL FILM;RM 1/8TS 150-J	
R603	61048-177-151	R-METAL FILM;RM 1/8TS 150-J	
R604	61048-177-151	R-METAL FILM;RM 1/8TS 150-J	
R606	61048-177-391	R-METAL FILM;RM 1/8TS 390-J	
R607	61048-177-151	R-METAL FILM;RM 1/8TS 150-J	
R608	61048-177-151	R-METAL FILM;RM 1/8TS 150-J	
R609	61048-177-151	R-METAL FILM;RM 1/8TS 150-J	
RM601	64529-312-051	REMOCON-MODULE;SV-06AMFC	
SW601	63599-016-070	SW-TACT;EVQ-QS2 05K	
SW602	63599-016-070	SW-TACT;EVQ-QS2 05K	
SW603	63599-016-070	SW-TACT;EVQ-QS2 05K	
SW604	63599-016-070	SW-TACT;EVQ-QS2 05K	
SW605	63599-016-070	SW-TACT;EVQ-QS2 05K	
SW606	63599-016-070	SW-TACT;EVQ-QS2 05K	
SW607	63599-016-070	SW-TACT;EVQ-QS2 05K	
SW608	63599-016-070	SW-TACT;EVQ-QS2 05K	
SW609	63599-016-070	SW-TACT;EVQ-QS2 05K	
SW610	63599-016-070	SW-TACT;EVQ-QS2 05K	

LOCA.NO	PART-NUMBER	DESCRIPTION;SPECIFICATION	REMARK
137		ASSY MAIN A : P-5 PAL MESECAM	
		SYSTEM CONTROL/SERVO PARTS	
C302	61417-109-210	C-CERAMIC.HK;CK45F TAPG 50V 104-Z	
C303	61507-121-450	C-POLYESTER;CQ921M TAPG 50V 682-K	
C304	61507-121-450	C-POLYESTER;CQ921M TAPG 50V 682-K	
C305	61637-504-471	C-ELEC;CEAP 16V 470M SG(10X12.5)	
C306	61637-503-221	C-ELEC;CEAP 10V 220M SG(6.3X11)	
C307	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C308	61607-421-160	C-ELECTROLYTIC;LC-0511-22-16-M TAPG	
C309	61507-121-260	C-POLYESTER;CQ921M TAPG 50V 104-J	
C310	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C311	61407-117-228	C-CERAMIC.AXIAL;CAX SL TAPG 50V 223-Z	
C312	61637-504-101	C-ELEC;CEAP 16V 100M SG(6.3X11)	
C313	61607-421-120	C-ELECTROLYTIC;LC-0511-4.7-50-M TAPG	
C314	61407-101-360	C-CERAMIC.TEMP;CC45 SL TAPG 50V 100-J	
C315	61607-421-120	C-ELECTROLYTIC;LC-0511-4.7-50-M TAPG	
C316	61637-504-101	C-ELEC;CEAP 16V 100M SG(6.3X11)	
C317	61407-101-360	C-CERAMIC.TEMP;CC45 SL TAPG 50V 100-J	
C318	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C319	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C320	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C321	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C322	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C323	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C324	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C326	61407-101-210	C-CERAMIC.TEMP;CC45 SL TAPG 50V 24-J	
C327	61407-101-140	C-CERAMIC.TEMP;CC45 SL TAPG 50V 12-J	
C328	61417-109-210	C-CERAMIC.HK;CK45F TAPG 50V 104-Z	
C329	61637-504-101	C-ELEC;CEAP 16V 100M SG(6.3X11)	
C330	61417-109-210	C-CERAMIC.HK;CK45F TAPG 50V 104-Z	
C331	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C332	61637-604-221	C-ELEC;CEAP 16V 220M SV(8X9)	
C333	61417-109-210	C-CERAMIC.HK;CK45F TAPG 50V 104-Z	
C334	61417-109-210	C-CERAMIC.HK;CK45F TAPG 50V 104-Z	
C335	61417-104-170	C-CERAMIC.HK;CK458 TAPG 50V 820-K	
C336	61417-109-210	C-CERAMIC.HK;CK45F TAPG 50V 104-Z	
C337	61417-104-170	C-CERAMIC.HK;CK458 TAPG 50V 820-K	
C338	61637-206-100	C-ELEC;CEAP 35V 10M SA(5X11)	
C339	61637-208-010	C-ELEC;CEAP 50V 1M SA(5X11)	
C389	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C399	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
CN301	63349-062-580	CONNECTOR-WAFER;5268-09A	
CN302	63349-062-590	CONNECTOR-WAFER;5268-10A	
CN303	63349-062-520	CONNECTOR-WAFER;5268-03A	
CN304	63053-607-030	LEAD CONNECTOR ASSY;1429/1007#26	
CN305	63053-209-113	LEAD CONNECTOR ASSY;1429 #26	
CN306	63349-062-350	CONNECTOR-WAFER;5267-06A	
CN308	63053-405-118	LEAD CONNECTOR ASSY;1061 #26	
D301	62169-406-482	DIODE;1N4148 SAMSUNG	
D302	62169-406-482	DIODE;1N4148 SAMSUNG	
D306	62169-406-482	DIODE;1N4148 SAMSUNG	
D307	62169-406-482	DIODE;1N4148 SAMSUNG	
D308	62169-201-050	DIODE;1N4001 TAPG	
D311	62169-406-482	DIODE;1N4148 SAMSUNG	
D312	62169-406-482	DIODE;1N4148 SAMSUNG	
IC301	62119-401-752	IC;U83C51HB	
IC302	62119-501-572	IC-LINEAR;LM358S(N.M)	
IC303	62119-401-348	IC;KS74HCTLS132	
IC304	62119-401-300	IC;KA8301(N.M)	
IC305	62119-103-676	IC;MN1280-Q	
IC306	62119-113-011	IC;MC78L09	
L301	62429-833-101	COIL-PEAKING AXIAL;BAL04ST 101K	
L302	62429-833-101	COIL-PEAKING AXIAL;BAL04ST 101K	
L303	62429-833-101	COIL-PEAKING AXIAL;BAL04ST 101K	
L304	62427-812-101	COIL-PEAKING;EL0606RA 100uH-J	
Q301	62137-701-012	TRANSISTOR;KSR 1003 TAPG	
Q302	62139-301-311	TRANSISTOR;KTC 2120Y	
Q305	62137-701-012	TRANSISTOR;KSR 1003 TAPG	
Q306	62137-701-012	TRANSISTOR;KSR 1003 TAPG	
Q307	62137-103-380	TRANSISTOR;KSA 733-Y TAPG	
Q310	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
Q311	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
Q312	62137-701-012	TRANSISTOR;KSR 1003 TAPG	
Q313	62137-701-012	TRANSISTOR;KSR 1003 TAPG	
Q314	62137-701-012	TRANSISTOR;KSR 1003 TAPG	
Q315	62137-701-012	TRANSISTOR;KSR 1003 TAPG	
Q316	62137-701-012	TRANSISTOR;KSR 1003 TAPG	
Q317	62137-701-012	TRANSISTOR;KSR 1003 TAPG	
R302	62137-701-012	TRANSISTOR;KSR 1003 TAPG	
R303	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R304	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R305	61048-177-512	R-METAL FILM;RM 1/8TS 5.1K-J	
R306	61048-177-512	R-METAL FILM;RM 1/8TS 5.1K-J	
R307	61048-177-272	R-METAL FILM;RM 1/8TS 2.7K-J	
R308	61048-177-272	R-METAL FILM;RM 1/8TS 2.7K-J	
R309	61048-177-472	R-METAL FILM;RM 1/8TS 4.7K-J	
R310	61048-177-122	R-METAL FILM;RM 1/8TS 1.2K-J	

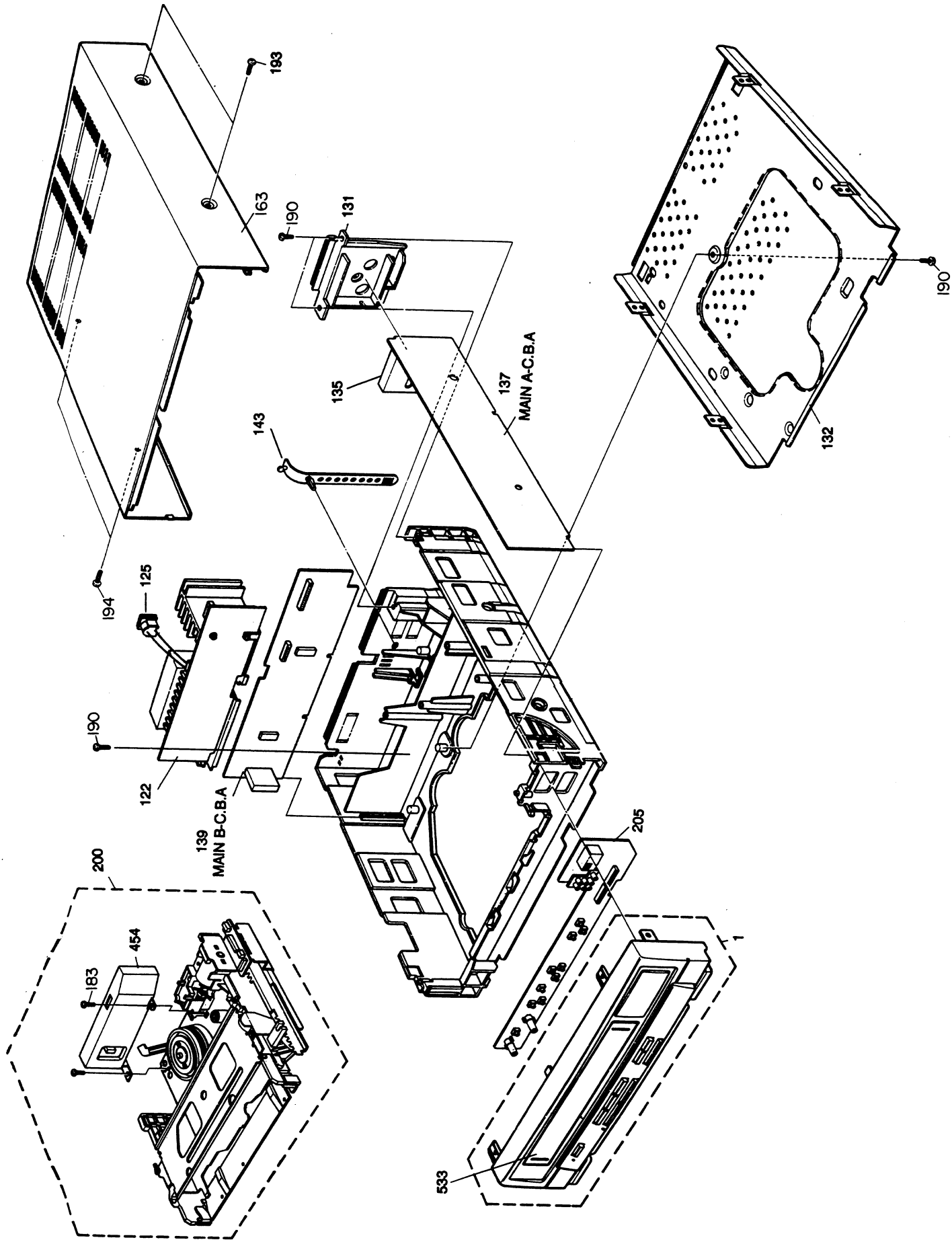
LOCA.NO	PART-NUMBER	DESCRIPTION;SPECIFICATION	REMARK
R311	61048-177-473	R-METAL FILM;RM 1/8TS 47K-J	
R312	61048-177-473	R-METAL FILM;RM 1/8TS 47K-J	
R313	61048-177-473	R-METAL FILM;RM 1/8TS 47K-J	
R314	61048-177-473	R-METAL FILM;RM 1/8TS 47K-J	
R315	61048-177-512	R-METAL FILM;RM 1/8TS 5.1K-J	
R316	61048-177-512	R-METAL FILM;RM 1/8TS 5.1K-J	
R317	61048-177-512	R-METAL FILM;RM 1/8TS 5.1K-J	
R318	61048-177-513	R-METAL FILM;RM 1/8TS 51K-J	
R319	61048-177-122	R-METAL FILM;RM 1/8TS 1.2K-J	
R320	61049-429-398	R-METAL OXIDE;RS 2P 3.9-J TAPG	
R321	61048-177-512	R-METAL FILM;RM 1/8TS 5.1K-J	
R322	61048-177-103	R-METAL FILM;RM 1/8TS 10K-J	
R323	61048-177-103	R-METAL FILM;RM 1/8TS 10K-J	
R324	61048-177-563	R-METAL FILM;RM 1/8TS 56K-J	
R325	61048-177-822	R-METAL FILM;RM 1/8TS 8.2K-J	
R326	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R327	61048-177-683	R-METAL FILM;RM 1/8TS 68K-J	
R328	61048-177-822	R-METAL FILM;RM 1/8TS 8.2K-J	
R329	61048-177-103	R-METAL FILM;RM 1/8TS 10K-J	
R330	61048-177-103	R-METAL FILM;RM 1/8TS 10K-J	
R331	61048-177-822	R-METAL FILM;RM 1/8TS 8.2K-J	
R332	61048-177-272	R-METAL FILM;RM 1/8TS 2.7K-J	
R333	61048-177-274	R-METAL FILM;RM 1/8TS 270K-J	
R334	61048-177-204	R-METAL FILM;RM 1/8TS 200K	
R335	61048-177-272	R-METAL FILM;RM 1/8TS 2.7K-J	
R336	61048-177-821	R-METAL FILM;RM 1/8TS 820-J	
R337	61048-177-750	R-METAL FILM;RM 1/8TS 75-J	
R338	61048-177-122	R-METAL FILM;RM 1/8TS 1.2K-J	
R339	61048-177-123	R-METAL FILM;RM 1/8TS 12K-J	
R340	61048-177-432	R-METAL FILM;RM 1/8TS 4.3K-J	
R341	61048-177-123	R-METAL FILM;RM 1/8TS 12K-J	
R342	61048-177-392	R-METAL FILM;RM 1/8TS 3.9K-J	
R343	61048-177-432	R-METAL FILM;RM 1/8TS 4.3K-J	
R344	61048-177-123	R-METAL FILM;RM 1/8TS 12K-J	
R345	61048-177-103	R-METAL FILM;RM 1/8TS 10K-J	
R346	61048-177-302	R-METAL FILM;RM 1/8TS 3K-J	
R347	61048-177-302	R-METAL FILM;RM 1/8TS 3K-J	
R348	61048-177-823	R-METAL FILM;RM 1/8TS 82K-J	
R351	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R352	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R353	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R354	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R355	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R356	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R357	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R358	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R359	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R360	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R361	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R362	61048-177-432	R-METAL FILM;RM 1/8TS 4.3K-J	
R363	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R364	61048-177-432	R-METAL FILM;RM 1/8TS 4.3K-J	
R365	61048-177-432	R-METAL FILM;RM 1/8TS 4.3K-J	
R366	61048-177-512	R-METAL FILM;RM 1/8TS 5.1K-J	
R367	61048-177-274	R-METAL FILM;RM 1/8TS 270K-J	
R368	61048-177-154	R-METAL FILM;RM 1/8TS 150K-J	
R369	61048-177-103	R-METAL FILM;RM 1/8TS 10K-J	
VR301	61246-105-104	VR-SEMI;RH0615C 100K	
VR302	61246-105-104	VR-SEMI;RH0615C 100K	
XT301	64539-012-525	CRYSTAL;12.000MHZ	
		AUDIO PARTS	
C501	61507-121-350	C-POLTESTER;CQ921M TAPG 100V 122-K	
C503	61637-208-010	C-ELEC;CEAP 50V 1M SA(5X11)	
C504	61607-421-160	C-ELECTROLYTIC;LC-0511-22-16-M TAPG	
C505	61507-121-530	C-POLYESTER;CQ921M TAPG 100V 333-K	
C506	61637-208-339	C-ELEC;CEAP 50V 3.3M SA(5X11)	
C507	61637-208-010	C-ELEC;CEAP 50V 1M SA(5X11)	
C509	61407-117-228	C-CERAMIC.AXIAL;CAX SL TAPG 50V 223-Z	
C510	61637-604-221	C-ELEC;CEAP 16V 220M SV(8X9)	
C511	61637-206-100	C-ELEC;CEAP 35V 10M SA(5X11)	
C512	61637-206-100	C-ELEC;CEAP 35V 10M SA(5X11)	
C513	61637-206-100	C-ELEC;CEAP 35V 10M SA(5X11)	
C514	61507-121-430	C-POLYESTER;CQ921M TAPG 100V 472-K	
C515	61507-121-360	C-POLYESTER;CQ921M TAPG 50V 152-K	
C516	61507-121-610	C-POLYESTER;CQ921M TAPG 100V 123-J	
C518	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C519	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C520	61417-109-210	C-CERAMIC.HK;CK45F TAPG 50V 104-Z	
C521	61417-104-170	C-CERAMIC.HK;CK458 TAPG 50V 820-K	
C522	61417-104-170	C-CERAMIC.HK;CK458 TAPG 50V 820-K	
CN501	63053-917-505	LEAD CONNECTOR ASSY;2547 #26 5264-5264	
CN501	63349-062-320	CONNECTOR-WAFER;5267-03A STICK	
CN502	63349-062-620	CONNECTOR WAFER;5268-13A	
IC501	62109-103-220	IC;KA2221(N.M)	
L501	62429-010-280	COIL-PEAKING;BOAM-22mH	
Q503	62149-401-265-	TRANSISTOR;2SD 1468 TAPG	
Q504	62149-401-265	TRANSISTOR;2SD 1468 TAPG	
R501	61048-177-333	R-METAL FILM;RM 1/8TS 33K-J	

LOCA.NO	PART-NUMBER	DESCRIPTION;SPECIFICATION	REMARK
R502	61048-177-101	R-METAL FILM;RM 1/8TS 100-J	
R503	61048-177-104	R-METAL FILM;RM 1/8TS 100K-J	
R504	61048-177-332	R-METAL FILM;RM 1/8TS 3.3K-J	
R505	61048-177-104	R-METAL FILM;RM 1/8TS 100K-J	
R506	61048-177-302	R-METAL FILM;RM 1/8TS 3K-J	
R509	61048-177-122	R-METAL FILM;RM 1/8TS 1.2K-J	
R510	61048-277-151	R-METAL FILM;RM 1/4T 150-J	
R511	61048-177-103	R-METAL FILM;RM 1/8TS 10K-J	
R512	61048-177-153	R-METAL FILM;RM 1/8TS 15K-J	
139		ASSY MAIN B : P-5 PAL MESECAM	
		VIDEO PARTS	
C401	61637-208-478	C-ELEC;CEAP 50V 0.47M SA(5X11)	
C402	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C403	61637-206-100	C-ELEC;CEAP 35V 10M SA(5X11)	
C404	61407-101-510	C-CERAMIC.TEMP;CC45 SL TAPG 50V 470-J	
C405	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C406	61507-121-600	C-POLYESTER;CQ921M TAPG 100V 563-K	
C407	61407-105-160	C-CERAMIC.TEMP;CC45 CH TAPG 50V 18-J	
C408	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C409	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C410	61407-101-360	C-CERAMIC.TEMP;CC45 SL TAPG 50V 100-J	
C411	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C412	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C413	61407-105-300	C-CERAMIC.TEMP;CC45 CH TAPG 50V 68-J	
C414	61407-105-680	C-CERAMIC.TEMP;CC45 CH TAPG 50V 200-J	
C415	61407-105-260	C-CERAMIC.TEMP;CC45 CH TAPG 50V 47-J	
C416	61637-208-229	C-ELEC;CEAP 50V 2.2M SA (5X11)	
C417	61637-208-229	C-ELEC;CEAP 50V 2.2M SA (5X11)	
C418	61407-101-240	C-CERAMIC.TEMP;CC45 SL TAPG 50V 33-J	
C419	61407-105-320	C-CERAMIC.TEMP;CC45 CH TAPG 50V 82-J	
C420	61407-105-280	C-CERAMIC.TEMP;CC45 CH TAPG 50V 56-J	
C421	61407-105-860	C-CERAMIC.TEMP;CC45 CH TAPG 50V 10-D	
C422	61637-208-478	C-ELEC;CEAP 50V 0.47M SA(5X11)	
C423	61407-105-180	C-CERAMIC.TEMP;CC45 CH TAPG 50V 22-J	
C424	61407-105-180	C-CERAMIC.TEMP;CC45 CH TAPG 50V 22-J	
C425	61407-105-180	C-CERAMIC.TEMP;CC45 CH TAPG 50V 22-J	
C426	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C427	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C428	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C429	61607-421-120	C-ELECTROLYTIC;LC-0511-4.7-50-M TAPG	
C430	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C431	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C432	61637-208-010	C-ELEC;CEAP 50V 1M SA(5X11)	
C433	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C434	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C435	61507-121-530	C-POLYESTER;CQ921M TAPG 100V 333-K	
C436	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C437	61637-208-010	C-ELEC;CEAP 50V 1M SA(5X11)	
C438	61507-121-430	C-POLYESTER;CQ921M TAPG 100V 472-K	
C439	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C441	61637-208-010	C-ELEC;CEAP 50V 1M SA(5X11)	
C442	61507-121-420	C-POLYESTER;CQ921M TAPG 100V 392-K	
C443	61637-208-010	C-ELEC;CEAP 50V 1M SA(5X11)	
C444	61507-121-390	C-POLYESTER;CQ921M TAPG 100V 222-K	
C445	61407-105-260	C-CERAMIC.TEMP;CC45 CH TAPG 50V 47-J	
C446	61407-101-240	C-CERAMIC.TEMP;CC45 SL TAPG 50V 33-J	
C447	61407-105-260	C-CERAMIC.TEMP;CC45 CH TAPG 50V 47-J	
C448	61407-105-690	C-CERAMIC.TEMP;CC45 CH TAPG 50V 51-J	
C449	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C450	61407-105-680	C-CERAMIC.TEMP;CC45 CH TAPG 50V 200-J	
C451	61637-208-010	C-ELEC;CEAP 50V 1M SA(5X11)	
C452	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C454	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C455	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C456	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C457	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C458	61407-101-160	C-CERAMIC.TEMP;CC45 SL TAPG 50V 15-J	
C459	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C460	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C462	61637-204-330	C-ELEC;CEAP 16V 33M SA(5X11)	
C464	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C465	61637-204-330	C-ELEC;CEAP 16V 33M SA(5X11)	
C466	61637-208-010	C-ELEC;CEAP 50V 1M SA(5X11)	
C467	61637-504-471	C-ELEC;CEAP 16V 470M SG(10X12.5)	
C468	61407-101-360	C-CERAMIC.TEMP;CC45 SL TAPG 50V 100-J	
C469	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C470	61637-503-221	C-ELEC;CEAP 10V 220M SG(6.3X11)	
C471	61407-101-360	C-CERAMIC.TEMP;CC45 SL TAPG 50V 100-J	
C472	61607-421-130	C-ELECTROLYTIC;LC-0511-47-16-M TAPG	
C473	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C474	61637-504-101	C-ELEC;CEAP 16V 100M SG(6.3X11)	
C475	61407-101-490	C-CERAMIC.TEMP;CC45 SL TAPG 50V 390-J	
C476	61507-121-490	C-POLYESTER;CQ921M TAPG 100V 183-K	
C477	61407-101-200	C-CERAMIC.TEMP;CC45 SL TAPG 50V 22-J	
CN401	63349-062-360	CONNECTOR-WAFER;5267-07A STICK	
CN402	63053-413-510	LEAD CONNECTOR ASSY;2547 #26 5264-5395	
D401	62169-406-482	DIODE;1N4148 SAMSUNG	

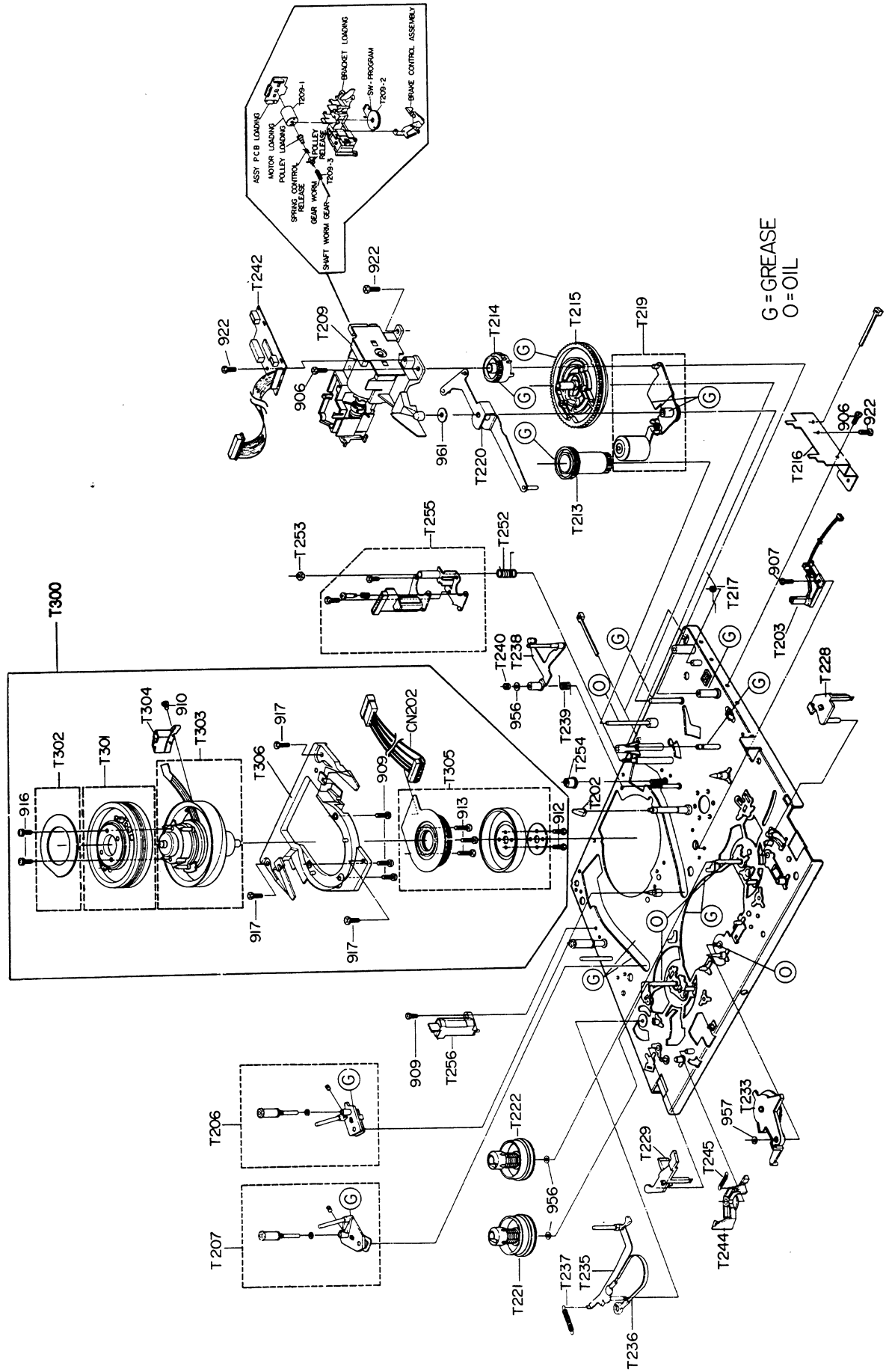
LOCA.NO	PART-NUMBER	DESCRIPTION;SPECIFICATION	REMARK
D402	62169-406-482	DIODE;1N4148 SAMSUNG	
D403	62169-406-482	DIODE;1N4148 SAMSUNG	
FL401	64529-416-023	FILTER-LC DIP TYPE;SLP+EQ-C	
FL402	64529-401-200	FILTER-LC;SFB 4141	
FL403	64529-310-010	FILTER-CERAMIC;SFE 4.5MB	
FL405	64529-006-011	DELAY LINE;MS-31PC-5K	
IC401	62119-401-346	IC;KA8113	
IC402	62119-101-755	IC;MSM6965-3RS	
IC403	62119-101-735	IC;TA8644N	
IC404	62119-103-694	IC;BA7025L	
L401	62429-833-101	COIL-PEAKING AXIAL;BAL04ST 101K	
L402	62427-812-151	COIL-PEAKING;EL0606RA 150uH-J	
L403	62427-812-680	COIL-PEAKING;EL0606RA 68uH-J	
L404	62427-812-220	COIL-PEAKING;EL0606RA 22uH-J	
L405	62427-812-470	COIL-PEAKING;EL0606RA 47uH-J	
L406	62427-812-180	COIL-PEAKING;EL0606RA 18uH-J	
L407	62427-812-100	COIL-PEAKING;EL0606RA 10uH-J	
L408	62427-812-470	COIL-PEAKING;EL0606RA 47uH-J	
L409	62427-812-150	COIL-PEAKING;EL0606RA 15uH-J	
L410	62429-833-101	COIL-PEAKING AXIAL;BAL04ST 101K	
L411	62429-010-280	COIL-PEAKING;8QAM-22mH	
L412	62427-812-150	COIL-PEAKING;EL0606RA 15uH-J	
Q401	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
Q402	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
Q403	62137-103-380	TRANSISTOR;KSA 733-Y TAPG	
Q404	62137-701-012	TRANSISTOR;KSR 1003 TAPG	
Q405	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
Q407	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
Q408	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
Q411	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
Q412	62137-103-380	TRANSISTOR;KSA 733-Y TAPG	
R401	61048-177-153	R-METAL FILM;RM 1/8TS 15K-J	
R402	61048-177-474	R-METAL FILM;RM 1/8TS 470K-J	
R403	61048-177-472	R-METAL FILM;RM 1/8TS 4.7K-J	
R404	61048-177-472	R-METAL FILM;RM 1/8TS 4.7K-J	
R405	61048-177-562	R-METAL FILM;RM 1/8TS 5.6K-J	
R406	61048-177-153	R-METAL FILM;RM 1/8TS 15K-J	
R407	61048-177-183	R-METAL FILM;RM 1/8TS 18K-J	
R408	61048-177-223	R-METAL FILM;RM 1/8TS 22K-J	
R409	61048-177-391	R-METAL FILM;RM 1/8TS 390-J	
R410	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R411	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R412	61048-177-472	R-METAL FILM;RM 1/8TS 4.7K-J	
R414	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R415	61048-177-222	R-METAL FILM;RM 1/8TS 2.2K-J	
R416	61048-177-272	R-METAL FILM;RM 1/8TS 2.7K-J	
R417	61048-177-124	R-METAL FILM;RM 1/8TS 120K-J	
R418	61048-177-475	R-METAL FILM;RM 1/8TS 4.7M-J	
R419	61048-177-222	R-METAL FILM;RM 1/8TS 2.2K-J	
R420	61048-177-682	R-METAL FILM;RM 1/8TS 6.8K-J	
R421	61048-177-202	R-METAL FILM;RM 1/8TS 2K-J	
R422	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R424	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R425	61048-177-122	R-METAL FILM;RM 1/8TS 1.2K-J	
R426	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R427	61048-177-182	R-METAL FILM;RM 1/8TS 1.8K-J	
R428	61048-177-562	R-METAL FILM;RM 1/8TS 5.6K-J	
R429	61048-177-181	R-METAL FILM;RM 1/8TS 180-J	
R430	61048-177-222	R-METAL FILM;RM 1/8TS 2.2K-J	
R431	61048-177-272	R-METAL FILM;RM 1/8TS 2.7K-J	
R432	61048-177-223	R-METAL FILM;RM 1/8TS 22K-J	
R433	61048-177-333	R-METAL FILM;RM 1/8TS 33K-J	
R434	61048-177-202	R-METAL FILM;RM 1/8TS 2K-J	
R435	61048-177-392	R-METAL FILM;RM 1/8TS 3.9K-J	
R436	61048-177-333	R-METAL FILM;RM 1/8TS 33K-J	
R437	61048-177-471	R-METAL FILM;RM 1/8TS 470-J	
R438	61048-177-474	R-METAL FILM;RM 1/8TS 470K-J	
R439	61048-177-103	R-METAL FILM;RM 1/8TS 10K-J	
R440	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R444	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R445	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R446	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R447	61048-177-393	R-METAL FILM;RM 1/8TS 39K-J	
R448	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R449	61048-177-153	R-METAL FILM;RM 1/8TS 15K-J	
R450	61048-177-391	R-METAL FILM;RM 1/8TS 390-J	
R451	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R452	61048-177-391	R-METAL FILM;RM 1/8TS 390-J	
R453	61048-177-122	R-METAL FILM;RM 1/8TS 1.2K-J	
R454	61048-177-122	R-METAL FILM;RM 1/8TS 1.2K-J	
R455	61048-177-222	R-METAL FILM;RM 1/8TS 2.2K-J	
R456	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R458	61048-177-103	R-METAL FILM;RM 1/8TS 10K-J	
R459	61048-177-223	R-METAL FILM;RM 1/8TS 22K-J	
R460	61048-177-151	R-METAL FILM;RM 1/8TS 150-J	
R461	61048-177-222	R-METAL FILM;RM 1/8TS 2.2K-J	
R462	61048-177-154	R-METAL FILM;RM 1/8TS 150K-J	
R466	61048-177-680	R-METAL FILM;RM 1/8TS 68-J	
R467	61048-177-560	R-METAL FILM;RM 1/8TS 56-J	
R468	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R469	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R470	61048-177-821	R-METAL FILM;RM 1/8TS 820-J	
R471	61048-177-122	R-METAL FILM;RM 1/8TS 1.2K-J	
R472	61048-177-682	R-METAL FILM;RM 1/8TS 6.8K-J	
R473	61048-177-223	R-METAL FILM;RM 1/8TS 22K-J	
VR401	61246-105-472	VR-SEMI;RH0615C 4.7K	
VR402	61246-105-472	VR-SEMI;RH0615C 4.7K	
VR403	61048-177-682	R-METAL FILM;RM 1/8TS 6.8K-J	
XT401	64539-012-040	CRYSTAL;4.433619MHZ	
454	69512-603-202	ASSY PREAMP;P-5 PAL MESECAM	
C801	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C802	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C803	61407-101-240	C-CERAMIC.TEMP;CC45 SL TAPG 50V 33-J	
C804	61407-101-240	C-CERAMIC.TEMP;CC45 SL TAPG 50V 33-J	
C805	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C806	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C807	61617-404-470	C-ELEC;CEAP 16V 47M RSS(6.3X7)	
C808	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C809	61407-101-510	C-CERAMIC.TEMP;CC45 SL TAPG 50V 470-J	
C810	61617-408-479	C-ELEC;CEAP 50V 4.7M RSS(4X7)	
C811	61407-105-260	C-CERAMIC.TEMP;CC45 CH TAPG 50V 47-J	
C812	61617-404-470	C-ELEC;CEAP 16V 47M RSS(6.3X7)	
C813	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C814	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C815	61407-101-470	C-CERAMIC.TEMP;CC45 SL TAPG 50V 300-J	
C816	61407-101-510	C-CERAMIC.TEMP;CC45 SL TAPG 50V 470-J	
C817	61407-101-160	C-CERAMIC.TEMP;CC45 SL TAPG 50V 15-J	
C818	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C819	61407-101-380	C-CERAMIC.TEMP;CC45 SL TAPG 50V 120-J	
C820	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C821	61407-105-320	C-CERAMIC.TEMP;CC45 CH TAPG 50V 82-J	
C822	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
C823	61507-121-450	C-POLYESTER;CQ921M TAPG 50V 682-K	
C824	61617-404-470	C-ELEC;CEAP 16V 47M RSS(6.3X7)	
C825	61407-117-228	C-CERAMIC.AXIAL;CAX SL TAPG 50V 223-Z	
C826	61407-105-320	C-CERAMIC.TEMP;CC45 CH TAPG 50V 82-J	
C827	61407-117-104	C-CERAMIC.AXIAL;CAX Y TAPG 16V 0.01-N	
CN801	63348-231-040	CONNECTOR-WAFER;52045-0410	
CN802	63053-407-212	LEAD CONNECTOR ASSY;1533 #26 5395-5264	
D801	62169-406-482	DIODE;1N4148 SAMSUNG	
IC801	62109-301-680	IC;UPC2313CA	
L801	62427-812-220	COIL-PEAKING;EL0606RA 22uH-J	
L802	62427-812-330	COIL-PEAKING;EL0606RA 33uH-J	
L803	62427-812-330	COIL-PEAKING;EL0606RA 33uH-J	
L804	62429-833-101	COIL-PEAKING AXIAL;BAL04ST 101K	
L805	62427-812-220	COIL-PEAKING;EL0606RA 22uH-J	
L806	62427-812-220	COIL-PEAKING;EL0606RA 22uH-J	
L807	62427-812-181	COIL-PEAKING;EL0606RA 180uH-J	
L808	62427-812-829	COIL-PEAKING;EL0606RA 8.2uH-J	
Q801	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
Q802	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
Q803	62137-103-380	TRANSISTOR;KSA 733-Y TAPG	
Q804	62137-302-740	TRANSISTOR;KSC 945-Y TAPG	
R801	61048-177-222	R-METAL FILM;RM 1/8TS 2.2K-J	
R802	61048-177-332	R-METAL FILM;RM 1/8TS 3.3K-J	
R803	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R804	61048-177-222	R-METAL FILM;RM 1/8TS 2.2K-J	
R805	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R806	61048-177-561	R-METAL FILM;RM 1/8TS 560-J	
R807	61048-177-562	R-METAL FILM;RM 1/8TS 5.6K-J	
R808	61048-177-222	R-METAL FILM;RM 1/8TS 2.2K-J	
R809	61048-177-331	R-METAL FILM;RM 1/8TS 330-J	
R810	61048-177-681	R-METAL FILM;RM 1/8TS 680-J	
R811	61048-177-152	R-METAL FILM;RM 1/8TS 1.5K-J	
R812	61048-177-222	R-METAL FILM;RM 1/8TS 2.2K-J	
R813	61048-177-222	R-METAL FILM;RM 1/8TS 2.2K-J	
R814	61048-177-391	R-METAL FILM;RM 1/8TS 390-J	
R815	61048-177-391	R-METAL FILM;RM 1/8TS 390-J	
R816	61048-177-331	R-METAL FILM;RM 1/8TS 330-J	
R817	61048-177-102	R-METAL FILM;RM 1/8TS 1K-J	
R818	61048-177-564	R-METAL FILM;RM 1/8TS 560K-J	
R819	61048-177-333	R-METAL FILM;RM 1/8TS 33K-J	
R820	61048-177-333	R-METAL FILM;RM 1/8TS 33K-J	
R821	61048-177-151	R-METAL FILM;RM 1/8TS 150-J	
R822	61048-177-472	R-METAL FILM;RM 1/8TS 4.7K-J	
R823	61048-177-183	R-METAL FILM;RM 1/8TS 18K-J	
R824	61048-177-683	R-METAL FILM;RM 1/8TS 68K-J	

7. MECHNICAL EXPLODED VIEWS

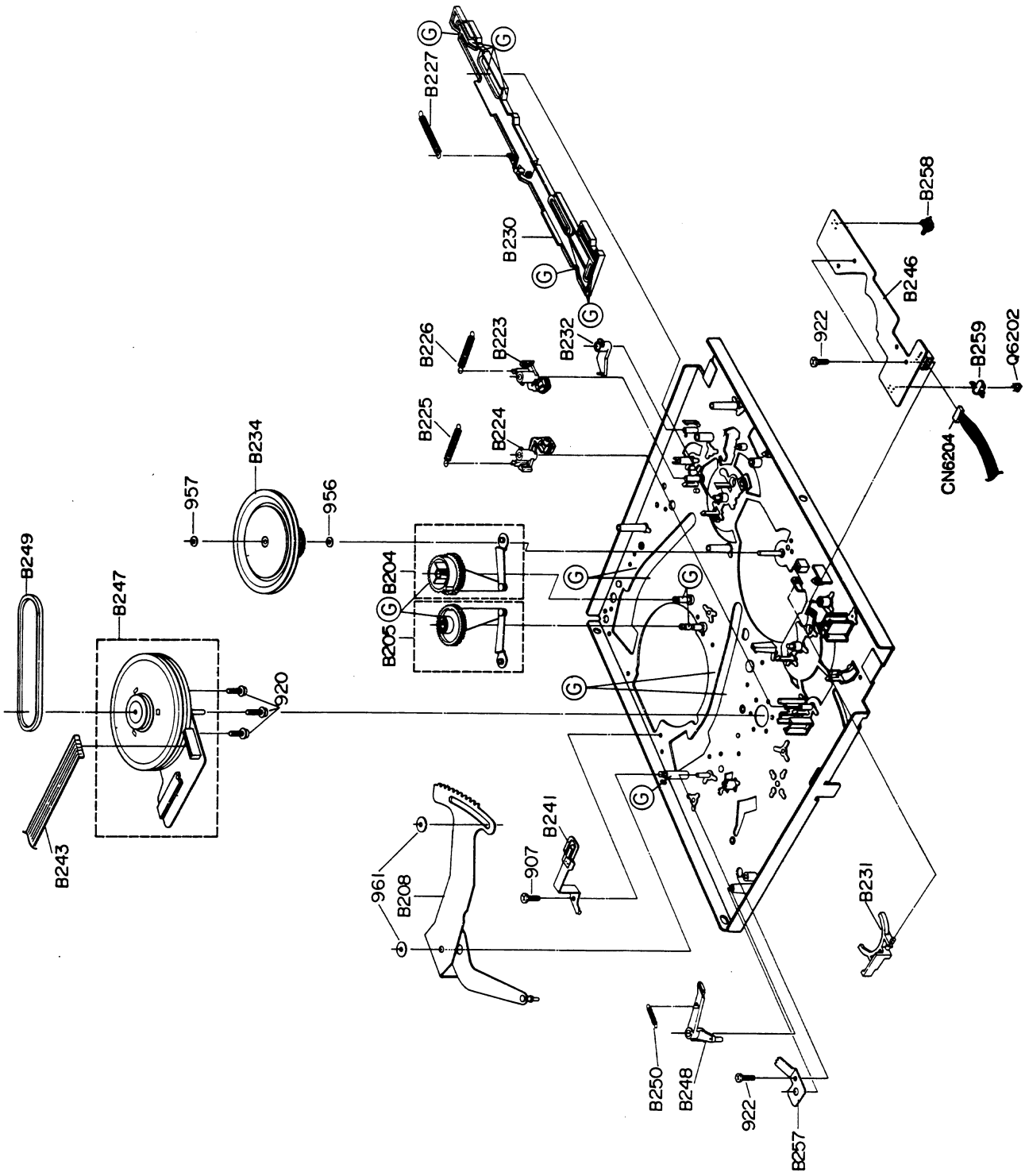
7-1. Instrument Assembly



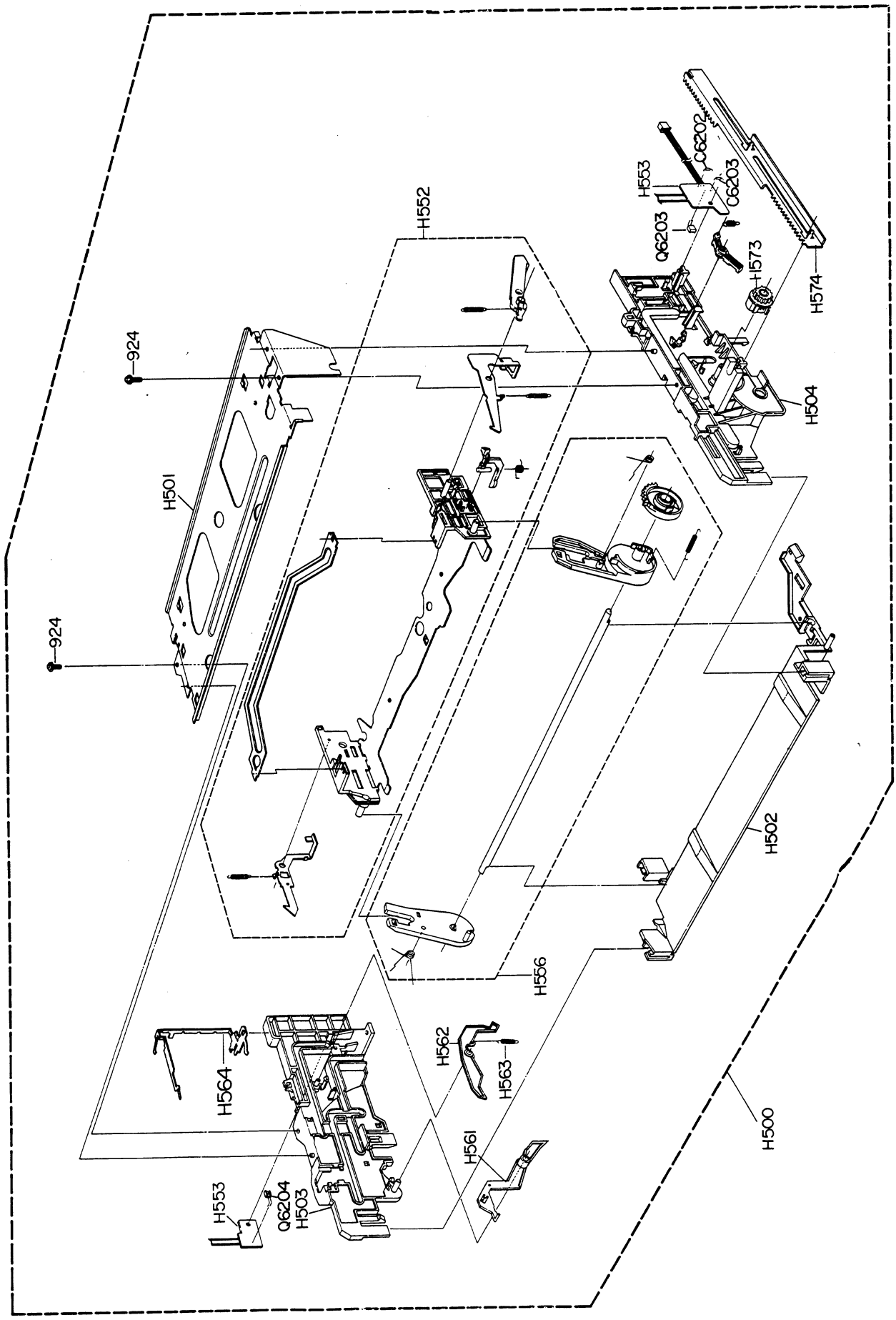
7-2. Tranport Mechanism Assembly



7-3. Bottom Side Mechanism Assembly

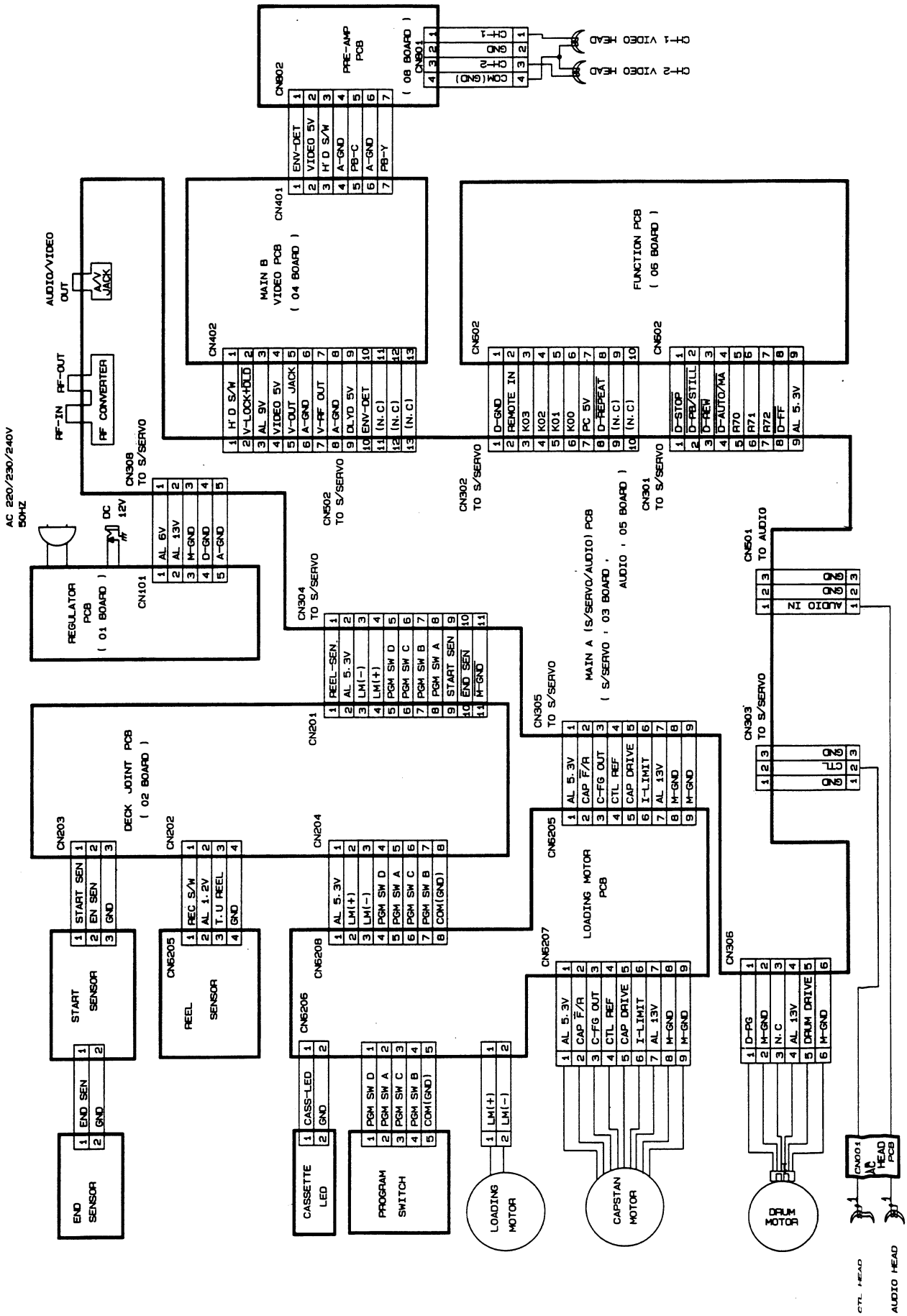


7-4. Housing Assembly

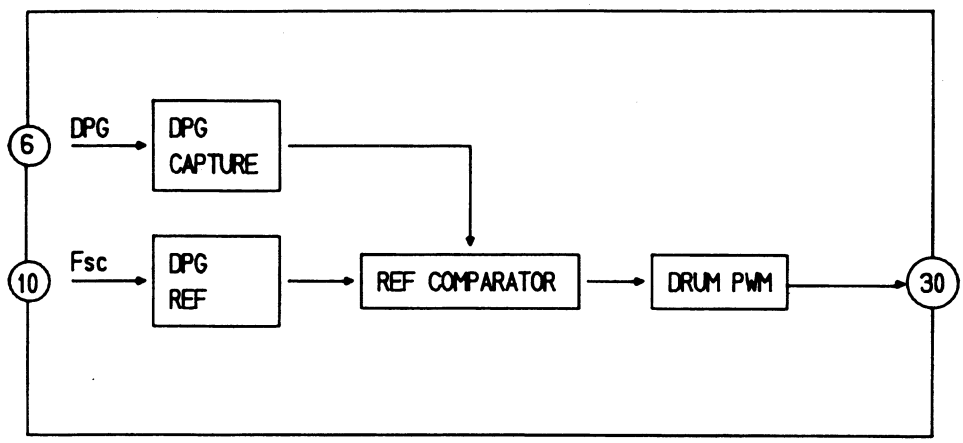


8. BLOCK DIAGRAMS

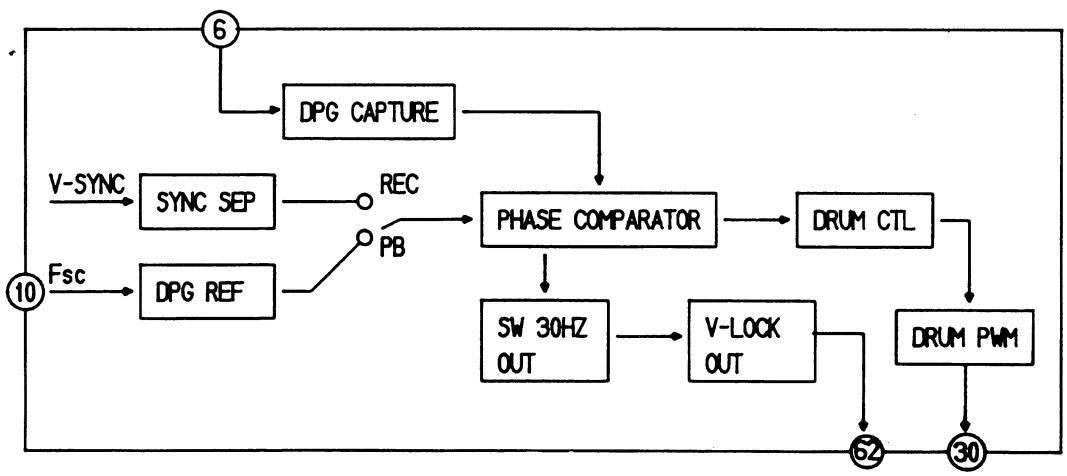
8-1. Total Wiring Diagram



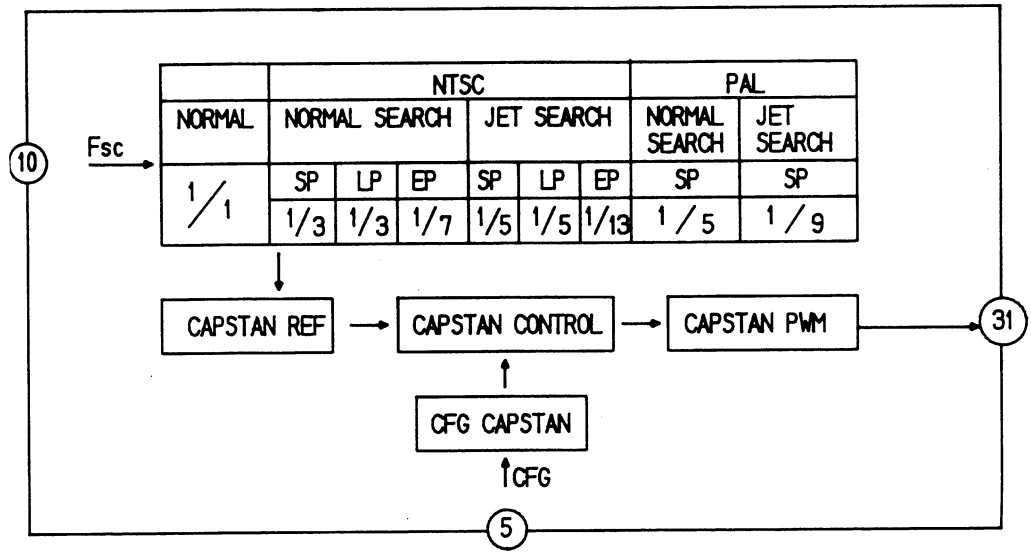
8-2. Drum Speed Control



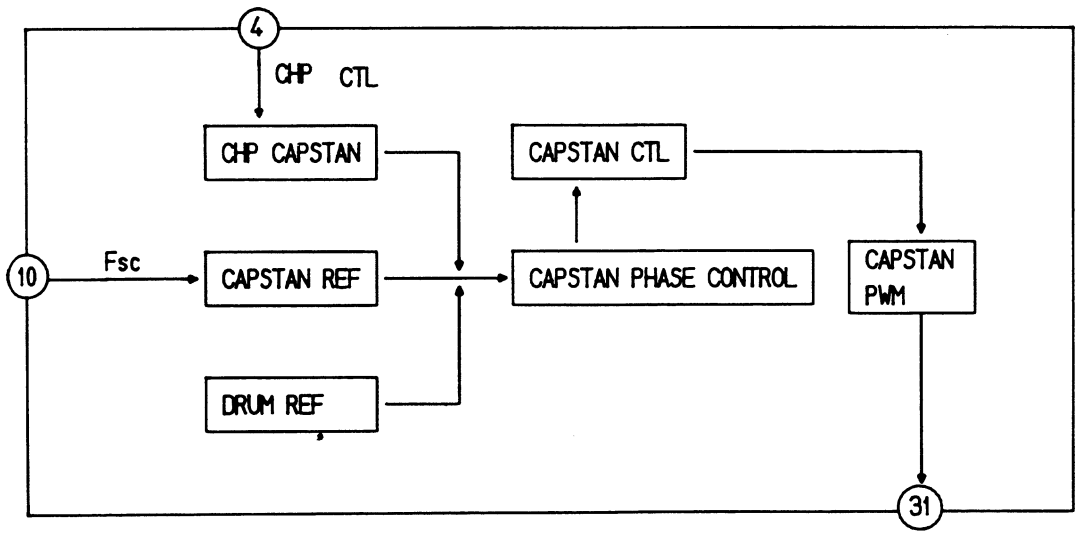
8-3. Drum Phase Control



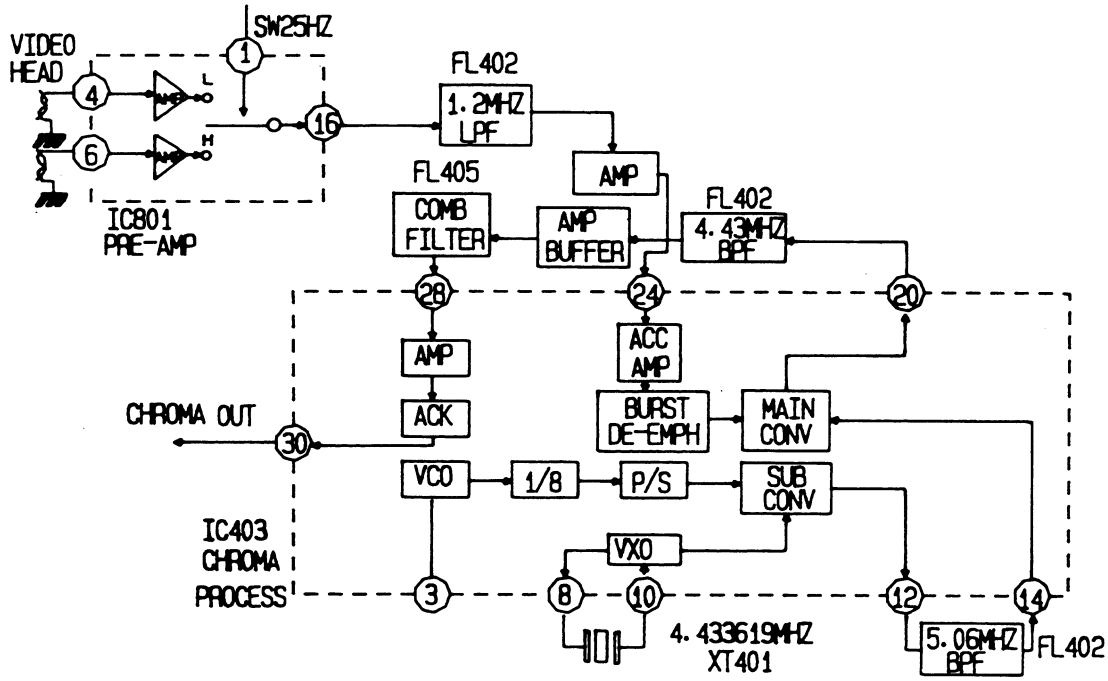
8-4. Capstan Speed Control



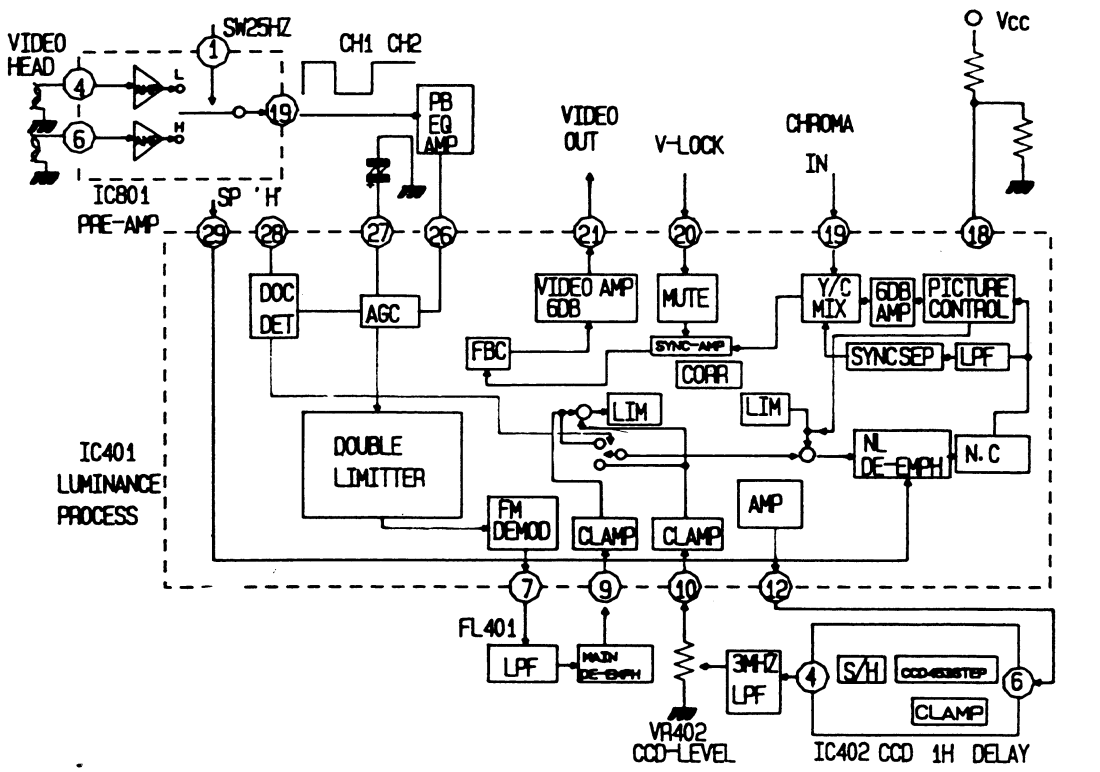
8-5. Capstan Phase Control



8-6. Luminance Playback Process



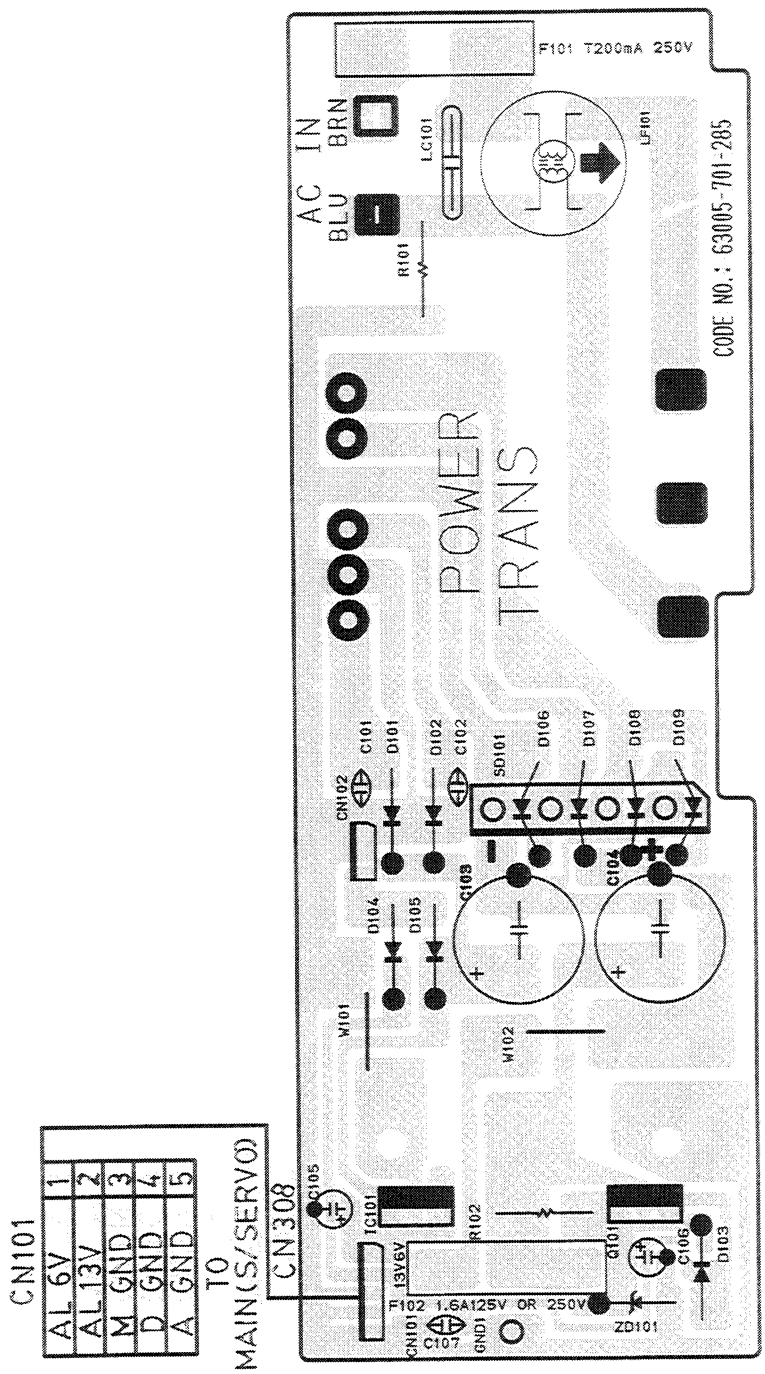
8-7. Chrominance Playback Process



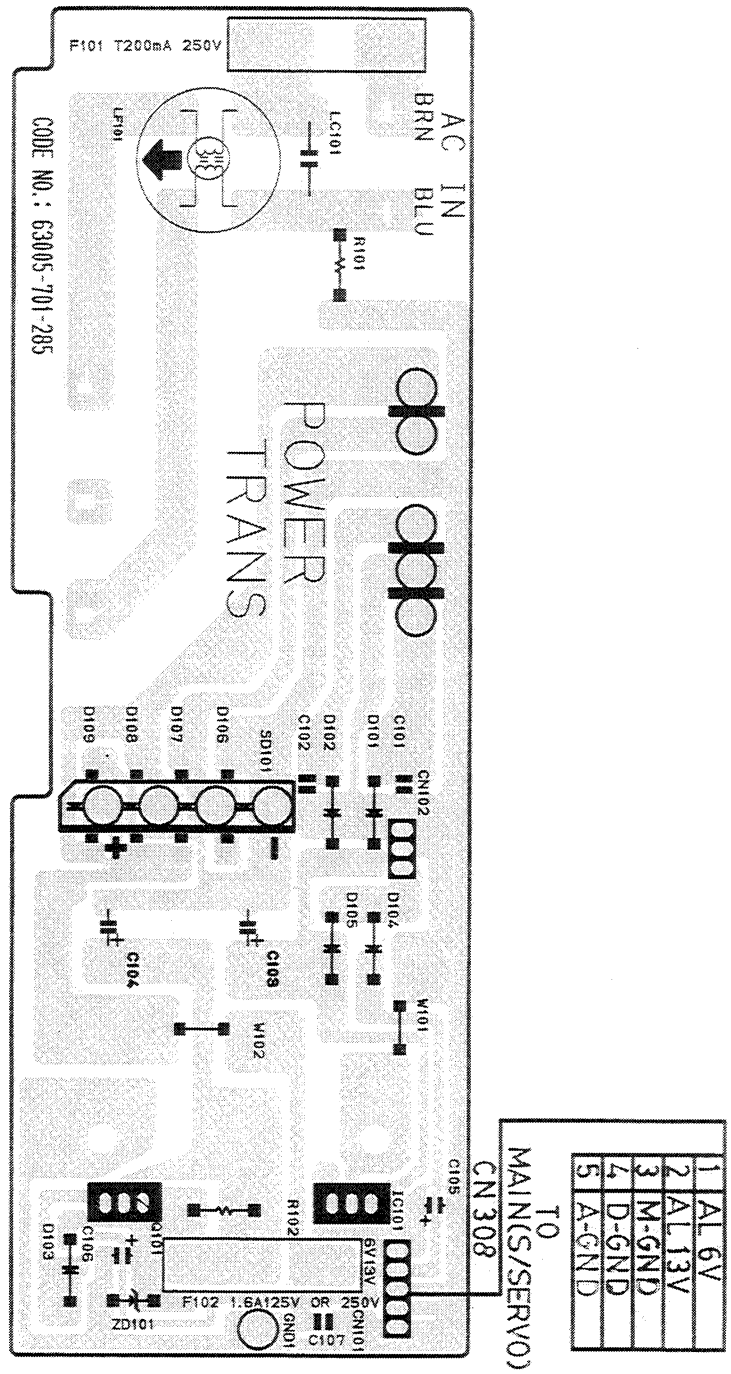
9. CIRCUIT BOARDS

Page

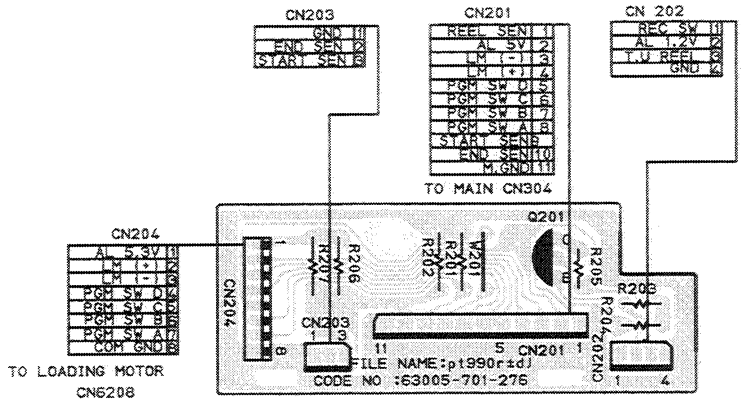
9-1. Regulator (Top Side)



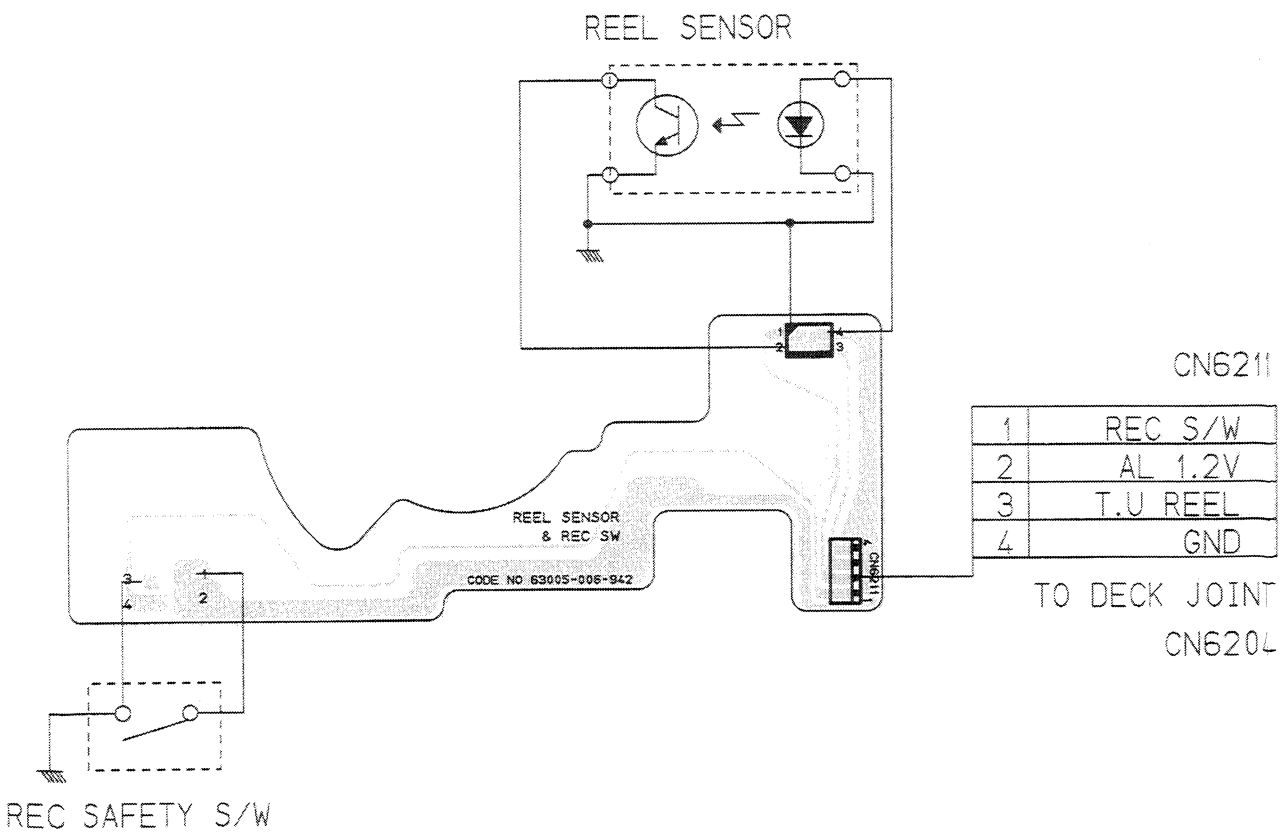
9-1. Regulator (Bottom Side)



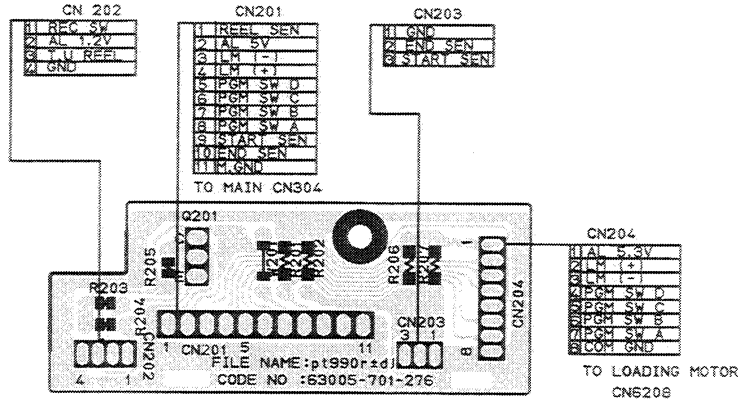
9-2. Deck Joint (Top Side)



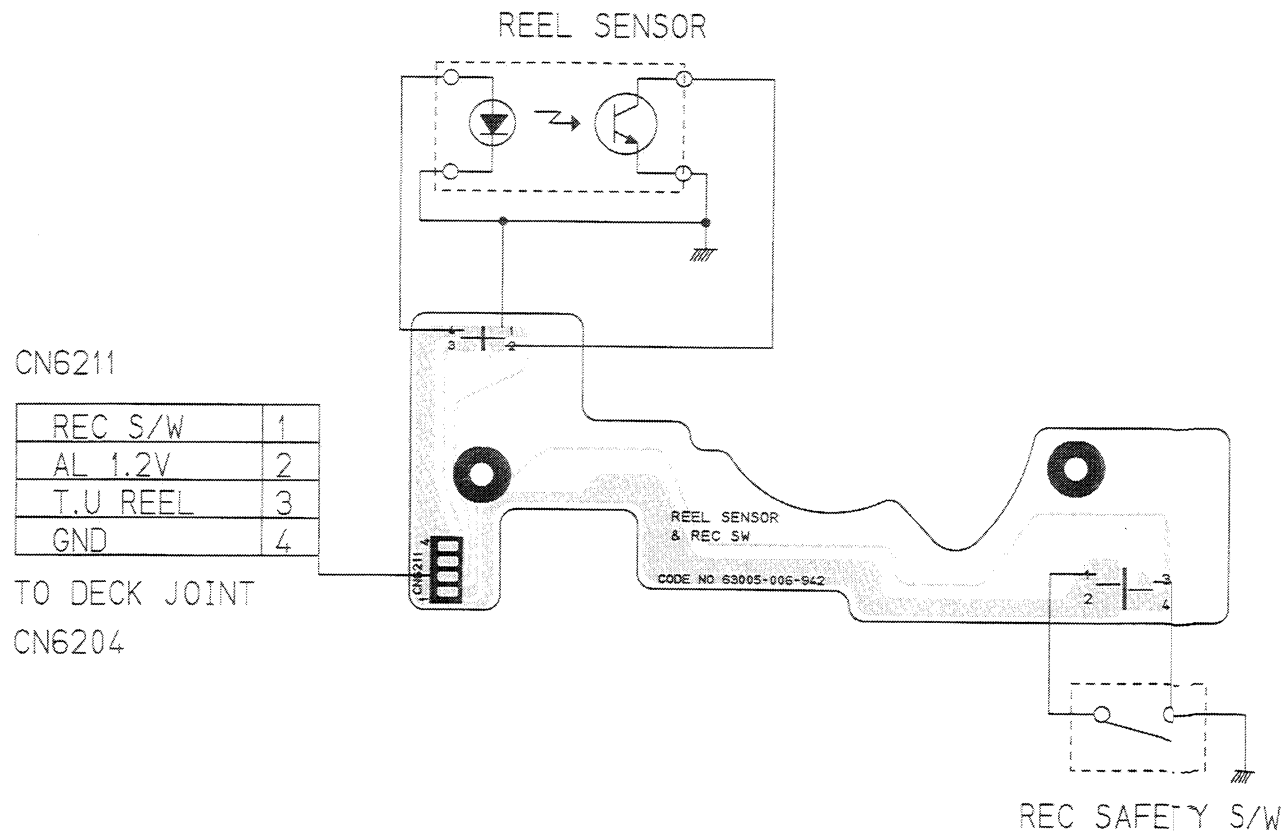
9-3. Reel Sensor (Top Side)



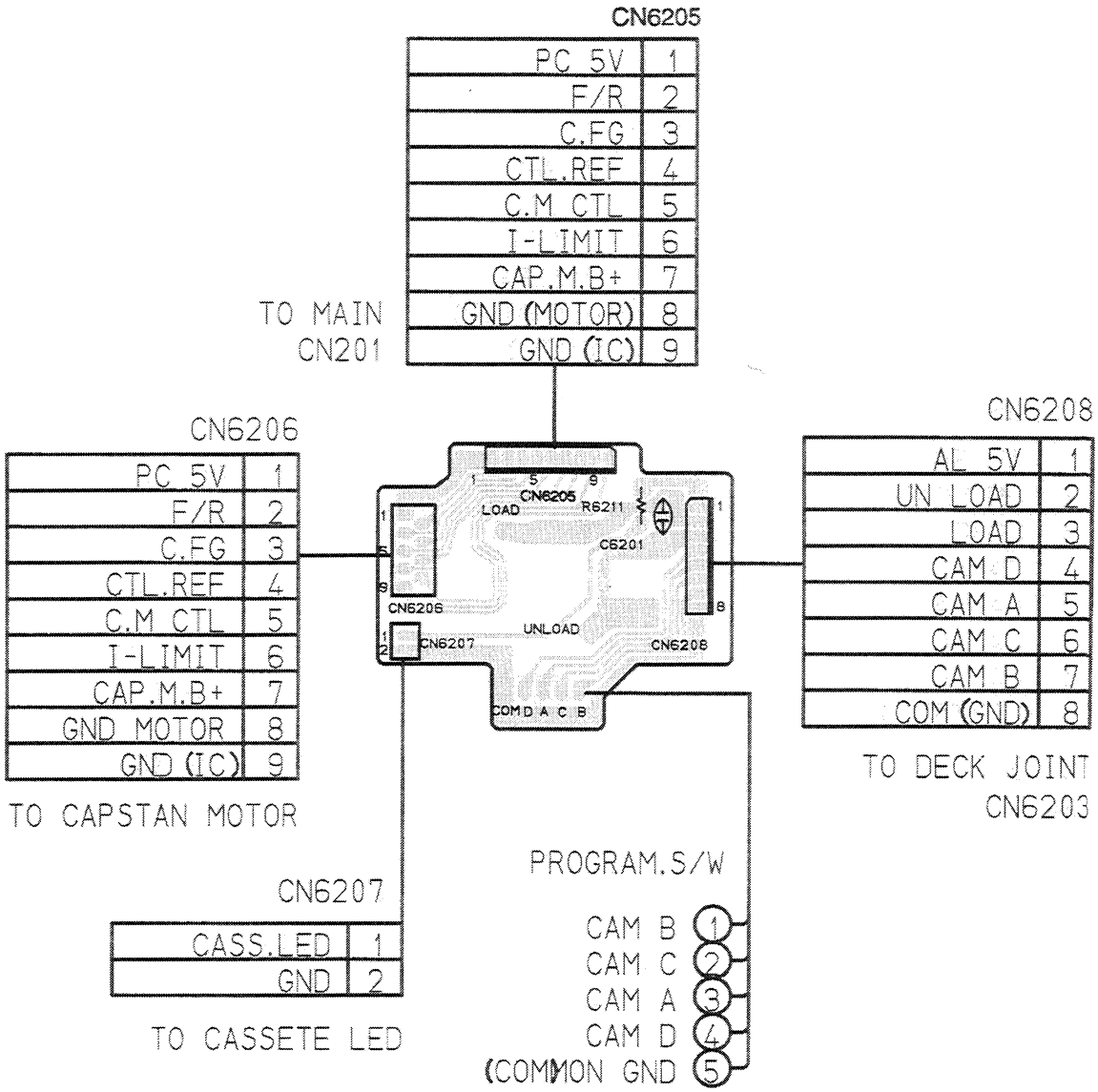
9-2. Deck Joint (Bottom Side)



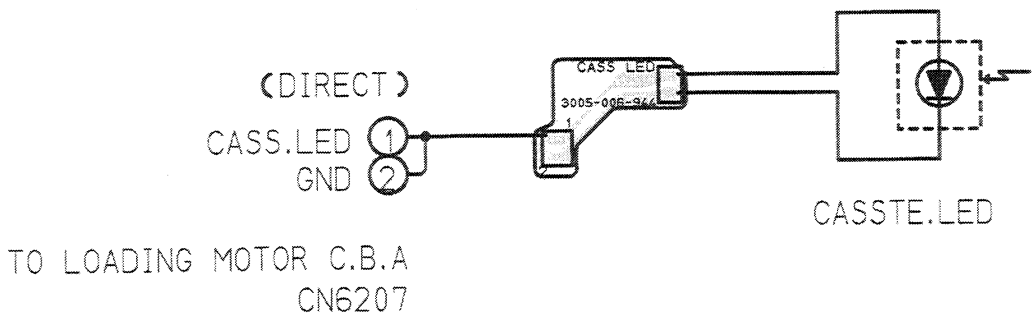
9-3. Reel Sensor (Bottom Side)



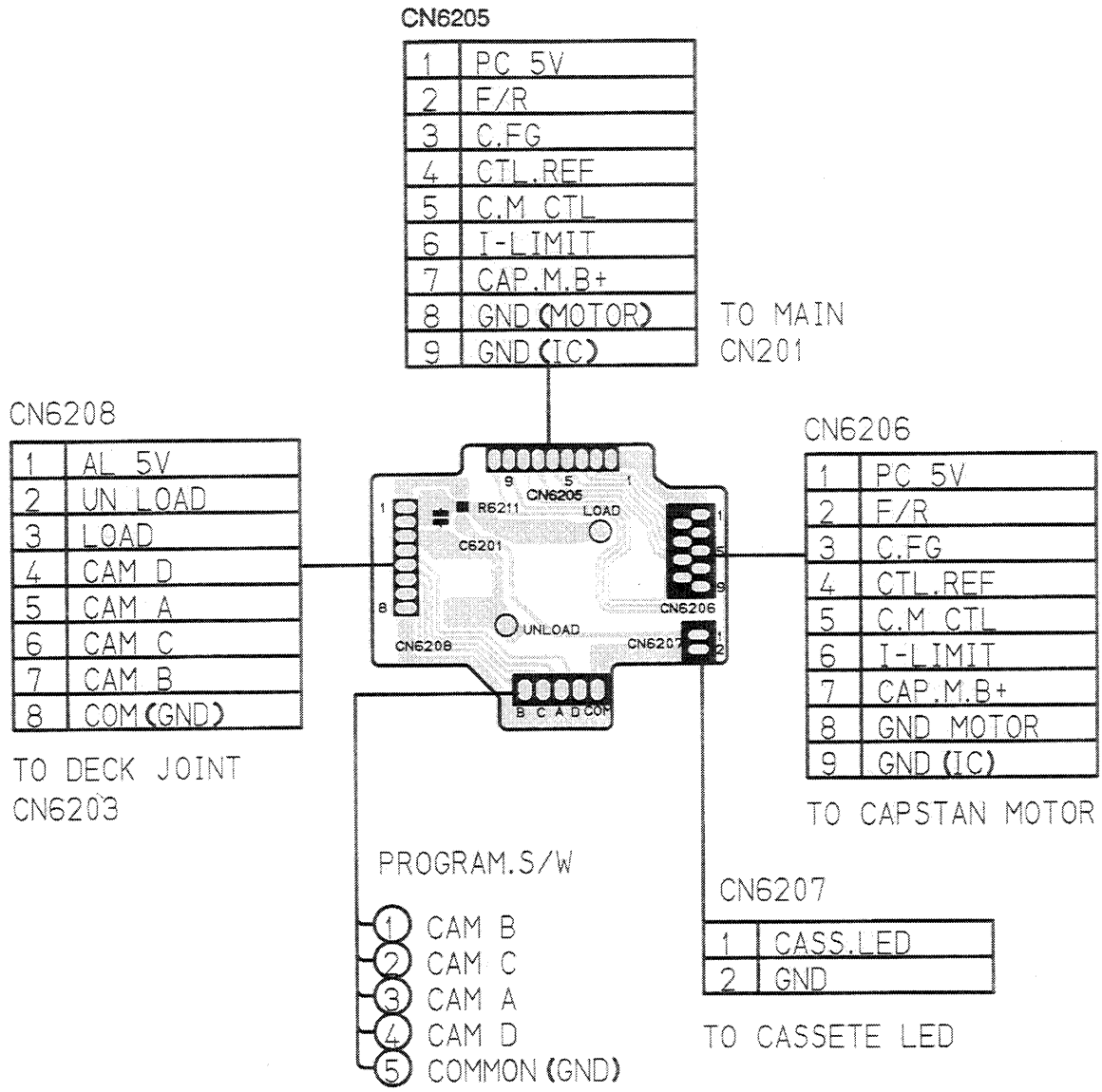
9-4. Loading Motor (Top Side)



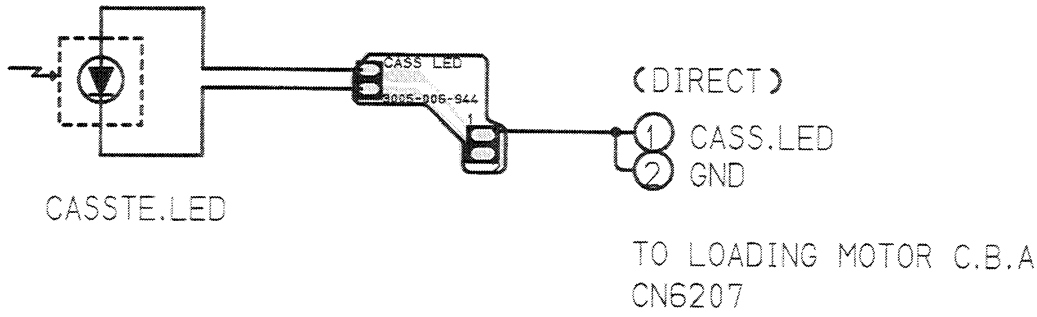
9-5. Cassette LED (Top Side)



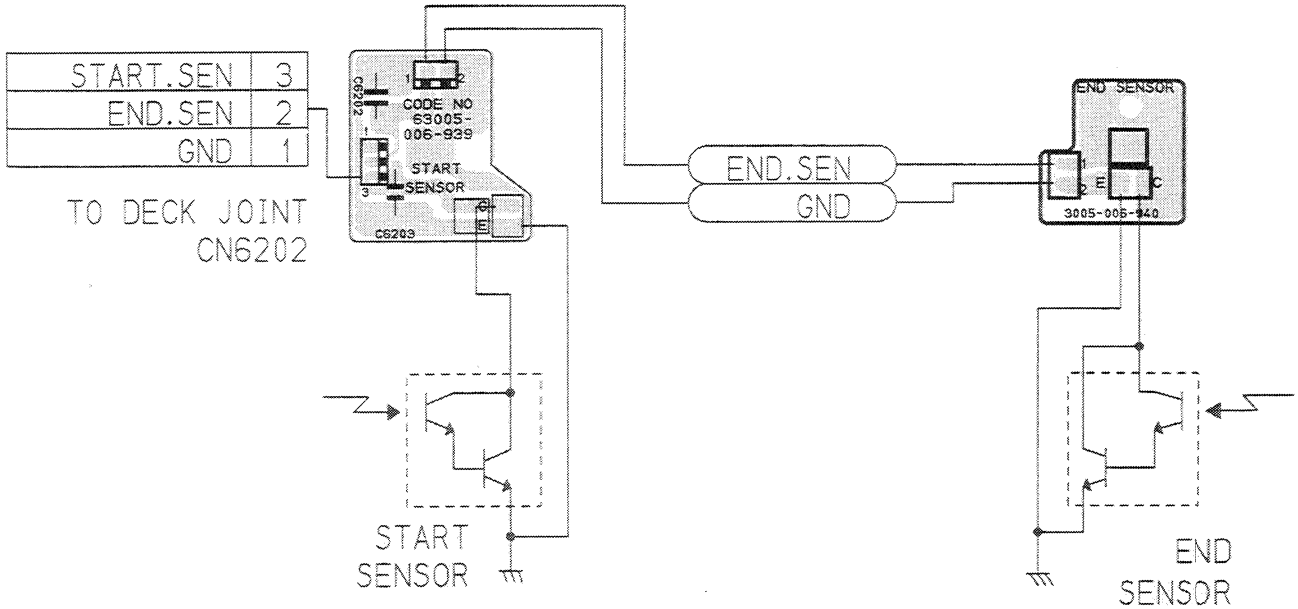
9-4. Loading Motor (Bottom Side)



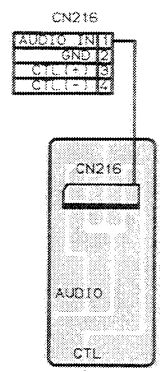
9-5. Cassette LED (Bottom Side)



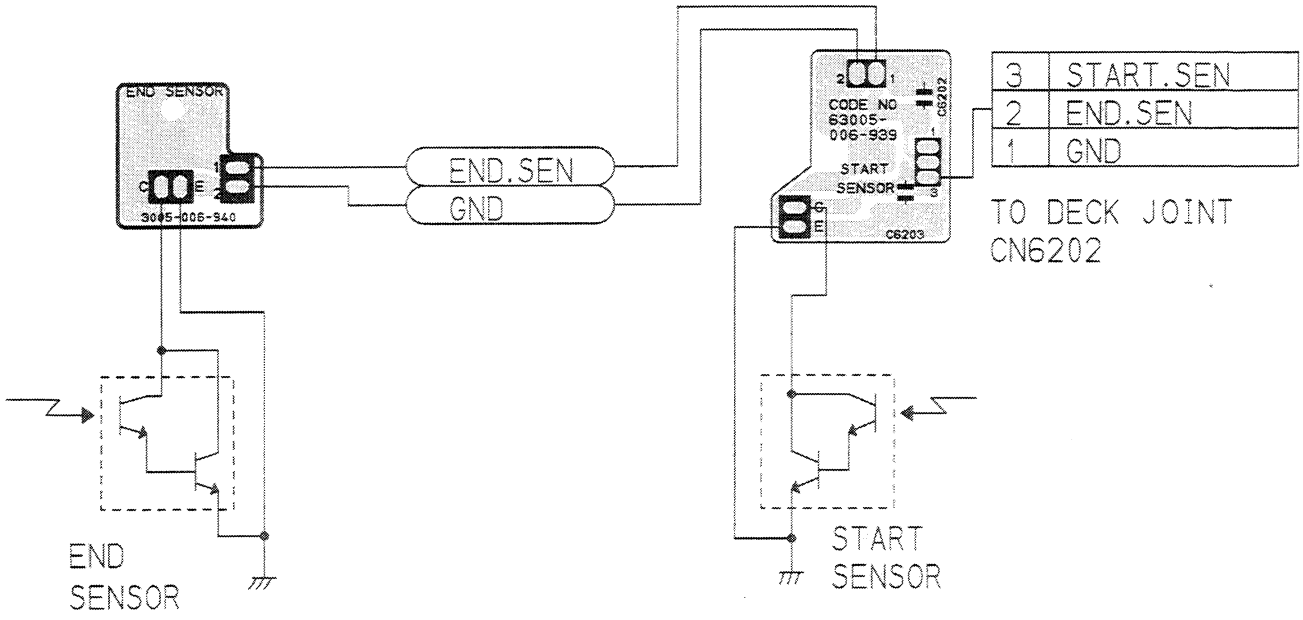
9-6. Start / End Sensor (Top Side)



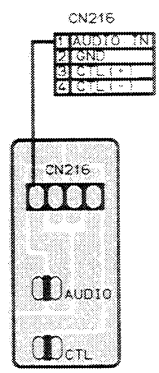
9-7. A/C Head (Top Side)



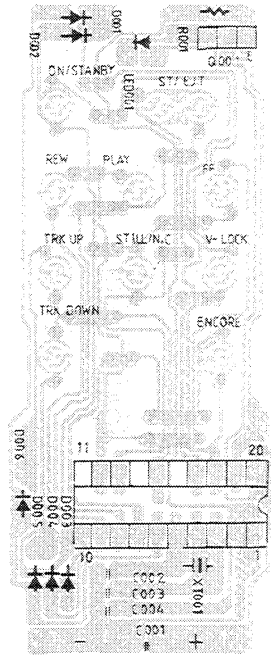
9-6. Start / End Sensor (Bottom Side)



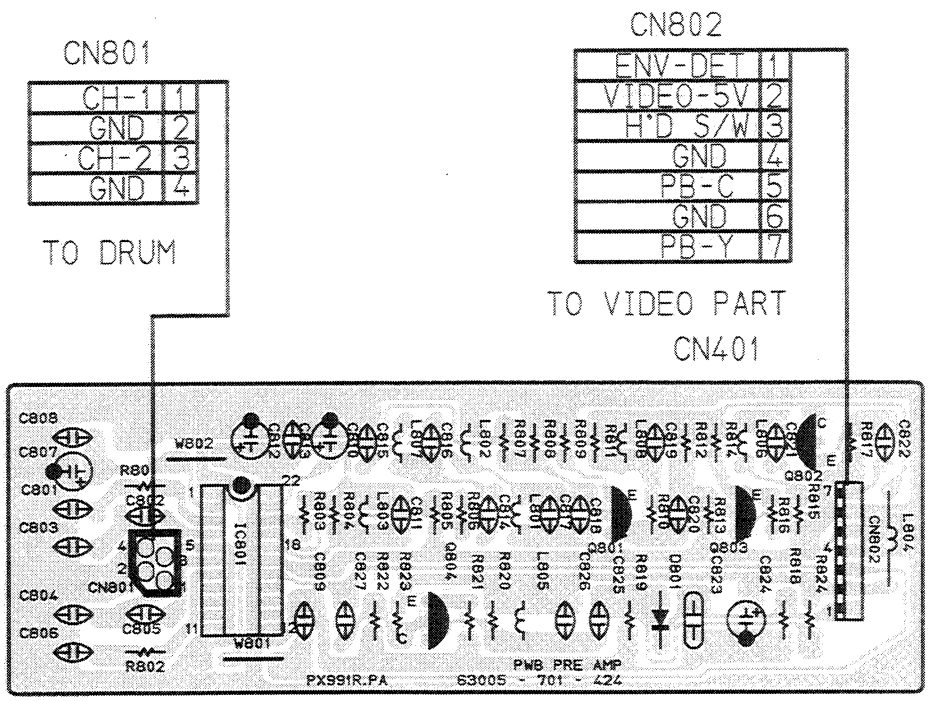
9-7. A/C Head (Bottom Side)



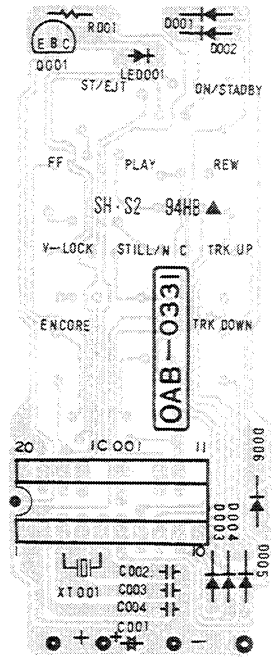
9-8. Remote Control (Top Side)



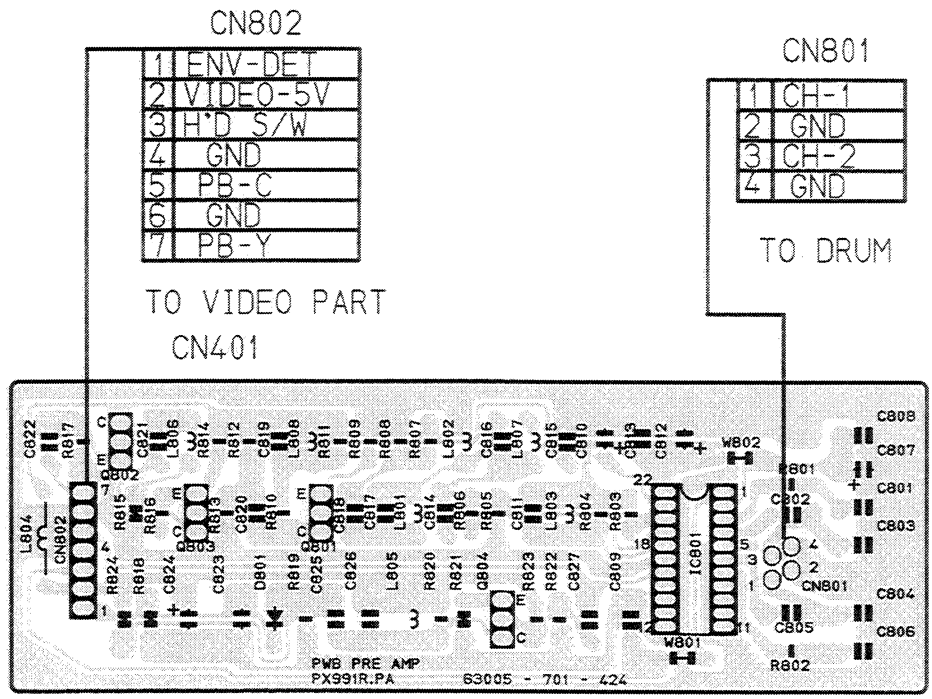
9-9. Pre-Amp (Top Side)



9-8. Remote Control (Bottom Side)



9-9. Pre-Amp (Bottom Side)



CN306

1	D-PG
2	M-GND
3	N.C
4	AL13V
5	D.DRIVE
7	MGND

FROM
DRUM MOROR
CN1

CN303

1	CTL(+)
2	CTL(-)
3	D.GND

FROM
CTL H/D
CN001

CN308

1	AL6V
2	AL13V
3	M-GND
4	D-GND
5	A-GND

FROM REGULATOR
CN101

CN501

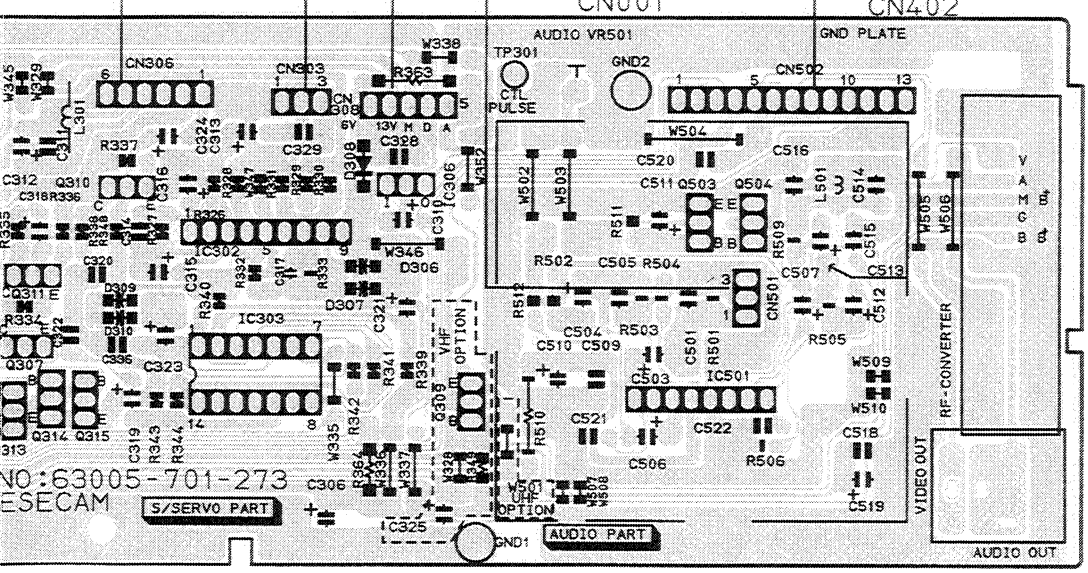
1	AUDIO IN
2	GND
3	GND

FROM A/C H'D
CN001

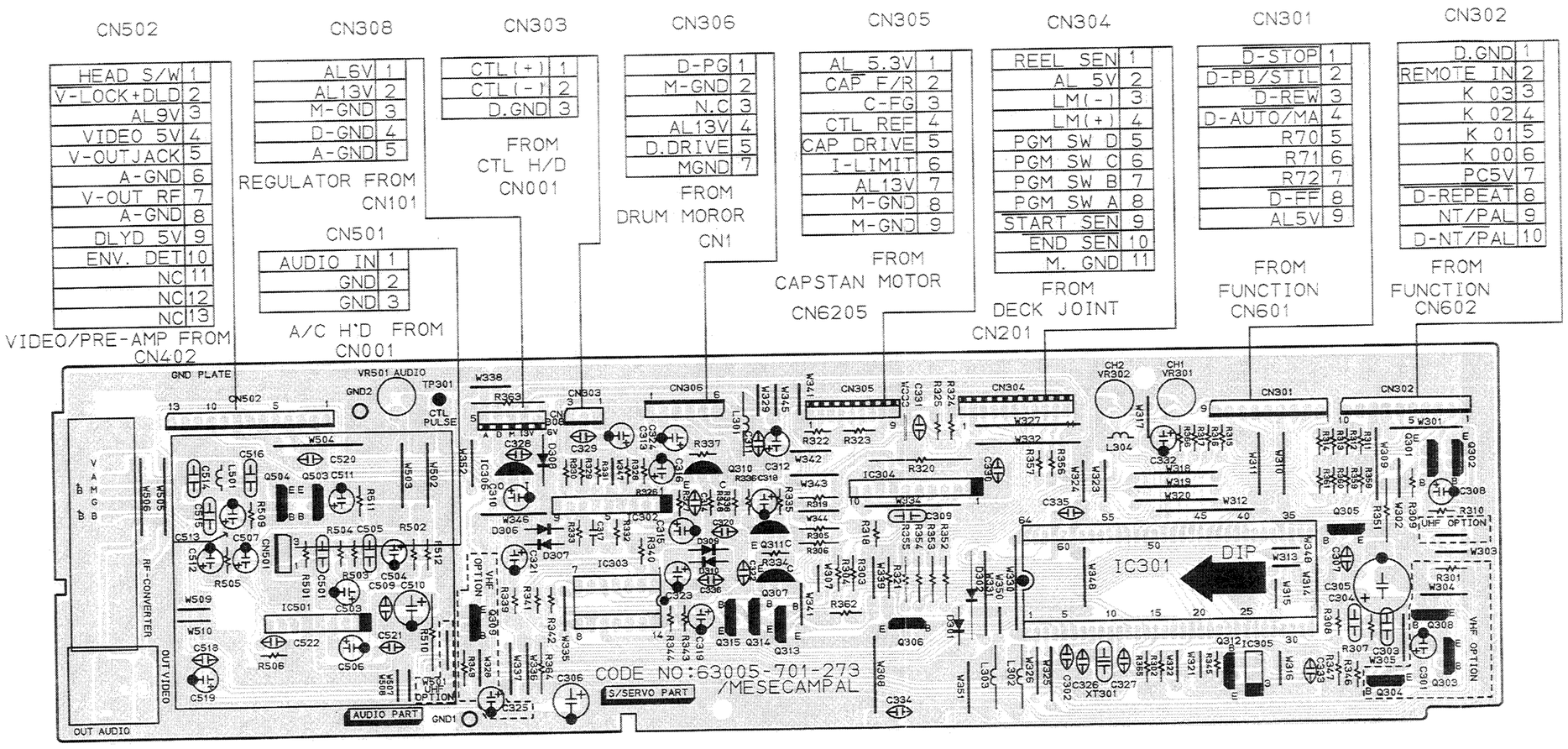
CN502

1	HEAD S/W
2	V-LOCK+$\overline{\text{DLD}}$
3	AL9V
4	VIDEO 5V
5	V-OUTJACK
6	A-GND
7	V-OUT RF
8	A-GND
9	DLYD 5V
10	ENV. DET
11	NC
12	NC
13	NC

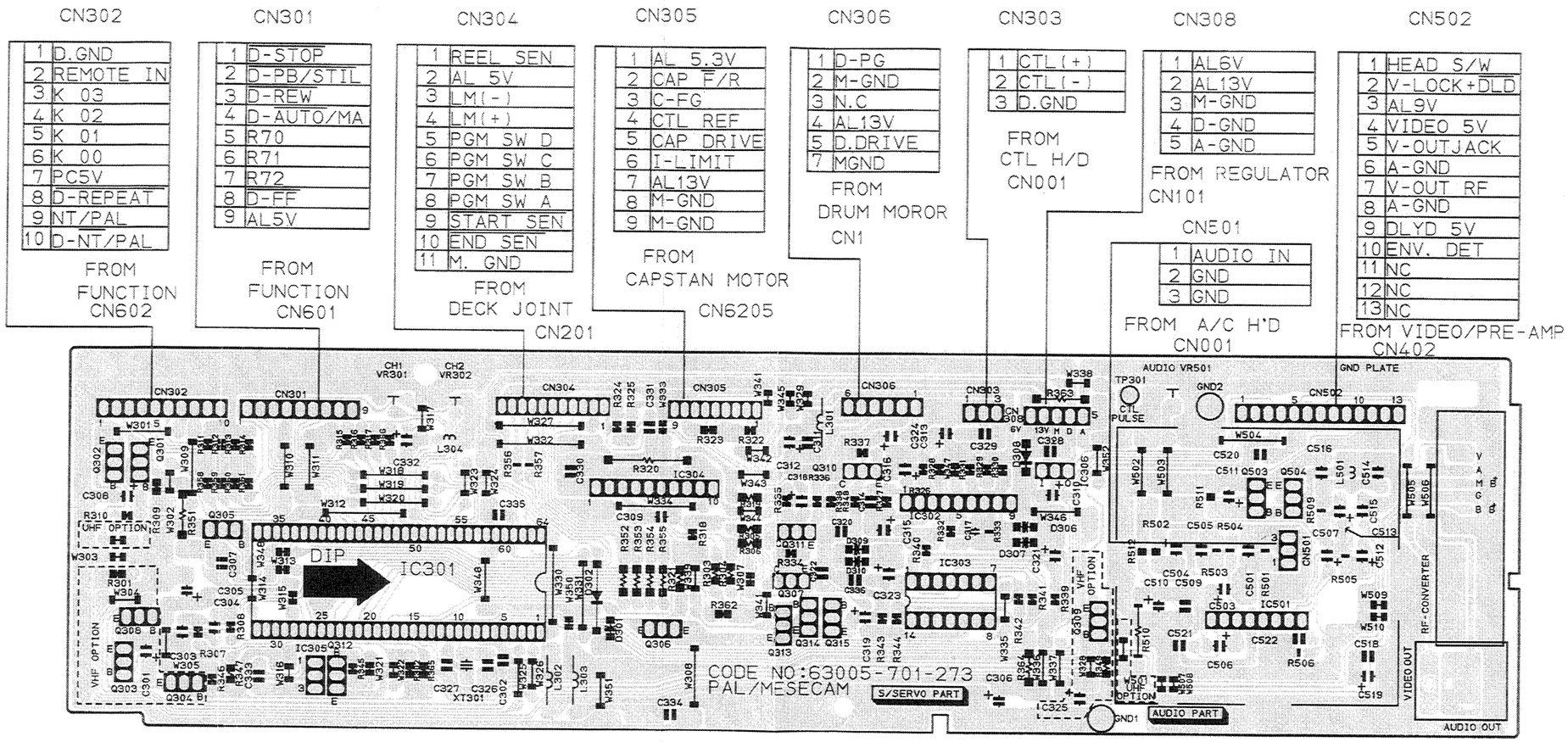
FROM VIDEO/PRE-AMP
CN402



9-10. Main. A (Top Side)



9-10. Main. A (Bottom Side)



9-11. Main. B (Top Side)

CN401

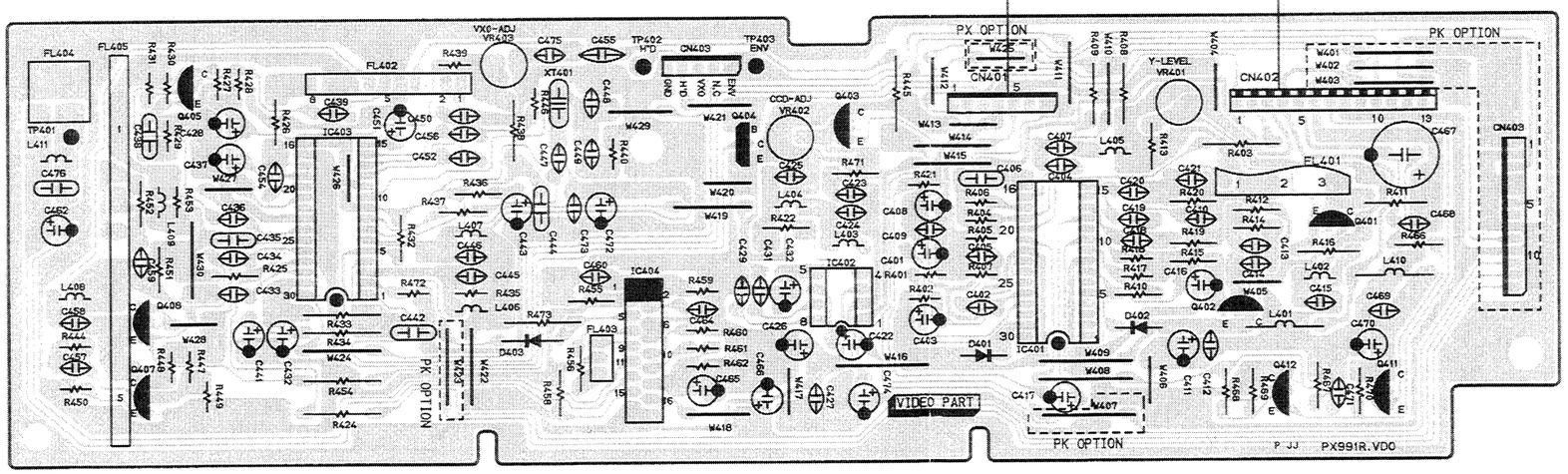
ENV-DET	1
VIDEO 5V	2
H'D SW	3
A-GND	4
PB-C	5
A-GND	6
PB-Y	7

TO
PRE/AMP
CN802

CN402

H'D SW	1
V-LOCK+DLD	2
AL 9V	3
VIDEO 5V	4
V-OUT JACK	5
A-GND	6
V-OUT RF	7
A-GND	8
DLD 5V	9
ENV. DET	10
N.C	11
N.C	12
N.C	13

TO
SYSCON/SERVO
CN502



9-11. Main. B (Bottom Side)

CN402

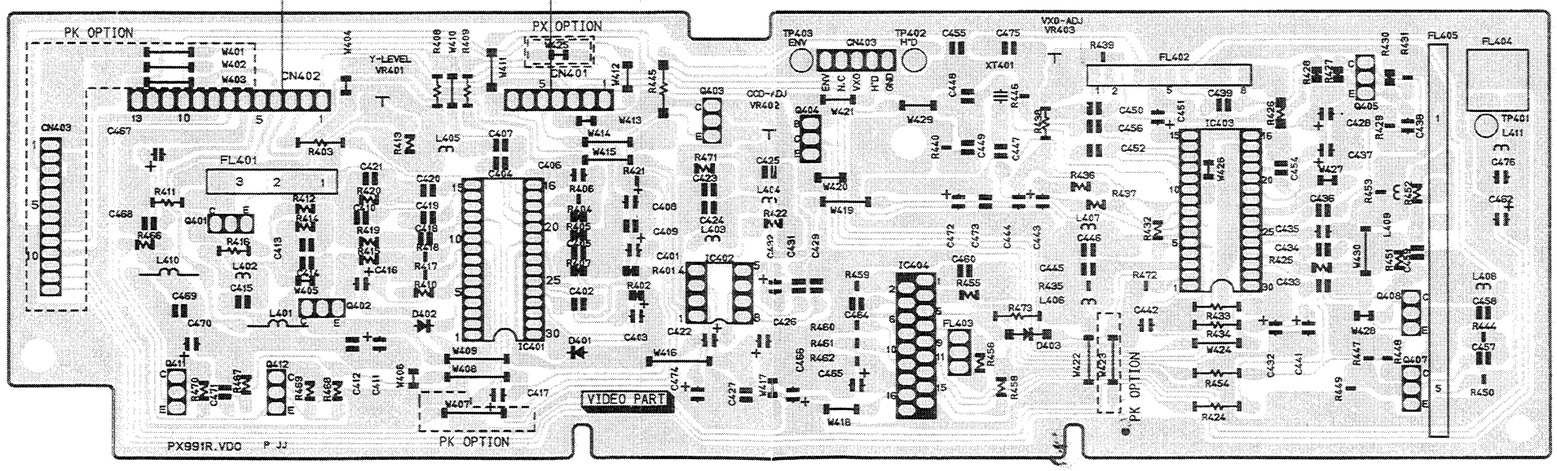
1	H'D SW
2	V-LOCK+DLD
3	AL 9V
4	VIDEO 5V
5	V-OUT JACK
6	A-GND
7	V-OUT RF
8	A-GND
9	DLD 5V
10	ENV. DET
11	N.C
12	N.C
13	N.C

TO
SYSCON/SERVO
CN502

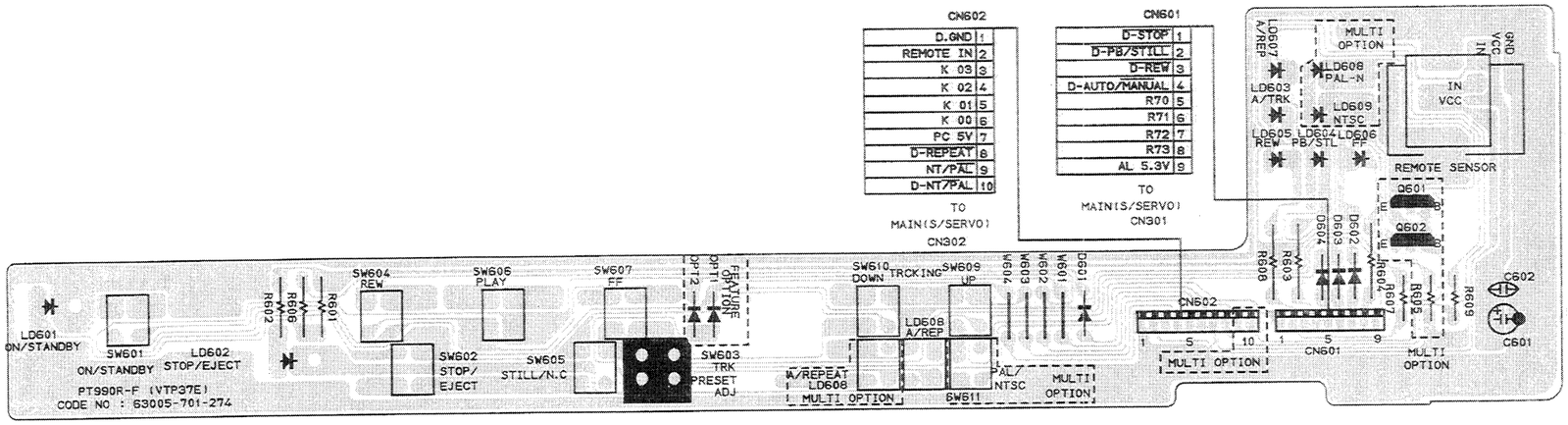
CN401

1	ENV-DET
2	VIDEO 5V
3	H'D SW
4	A-GND
5	PB-C
6	A-GND
7	PB-Y

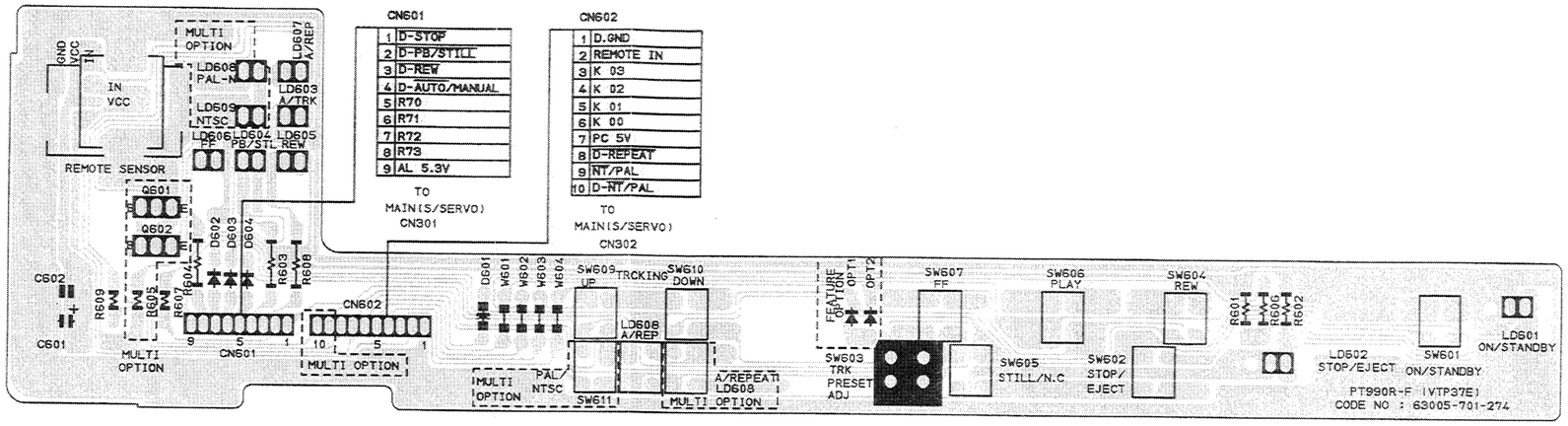
TO
PRE/AMP
CN802



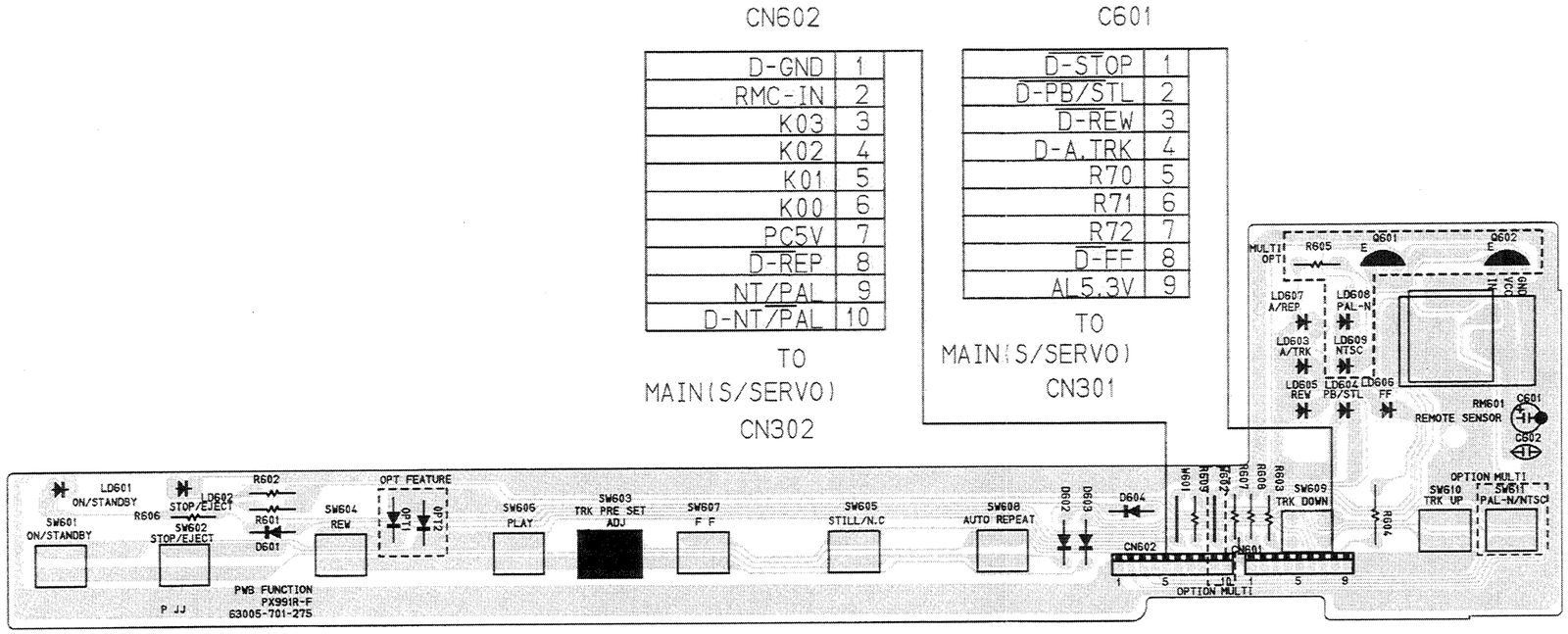
9-12. Function (PX-990/990R) (Top Side)



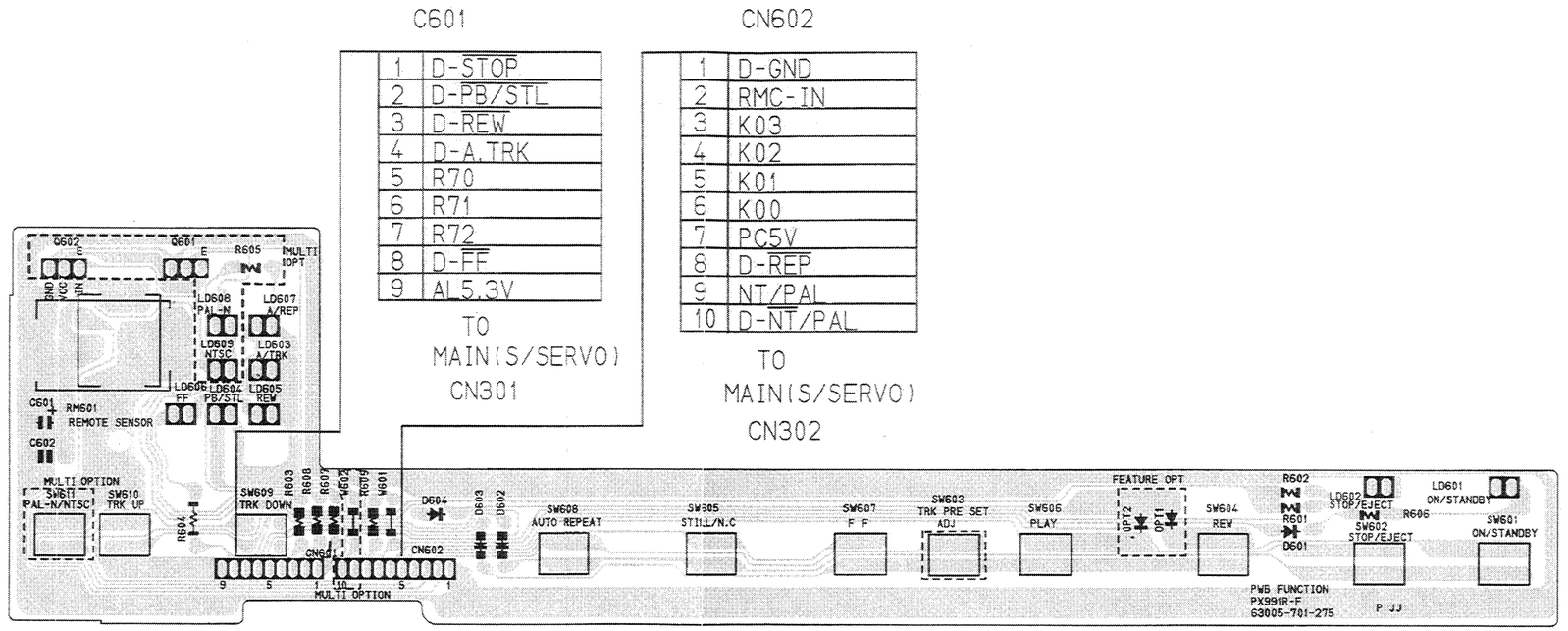
9-12. Function (PX-990/990R) (Bottom Side)



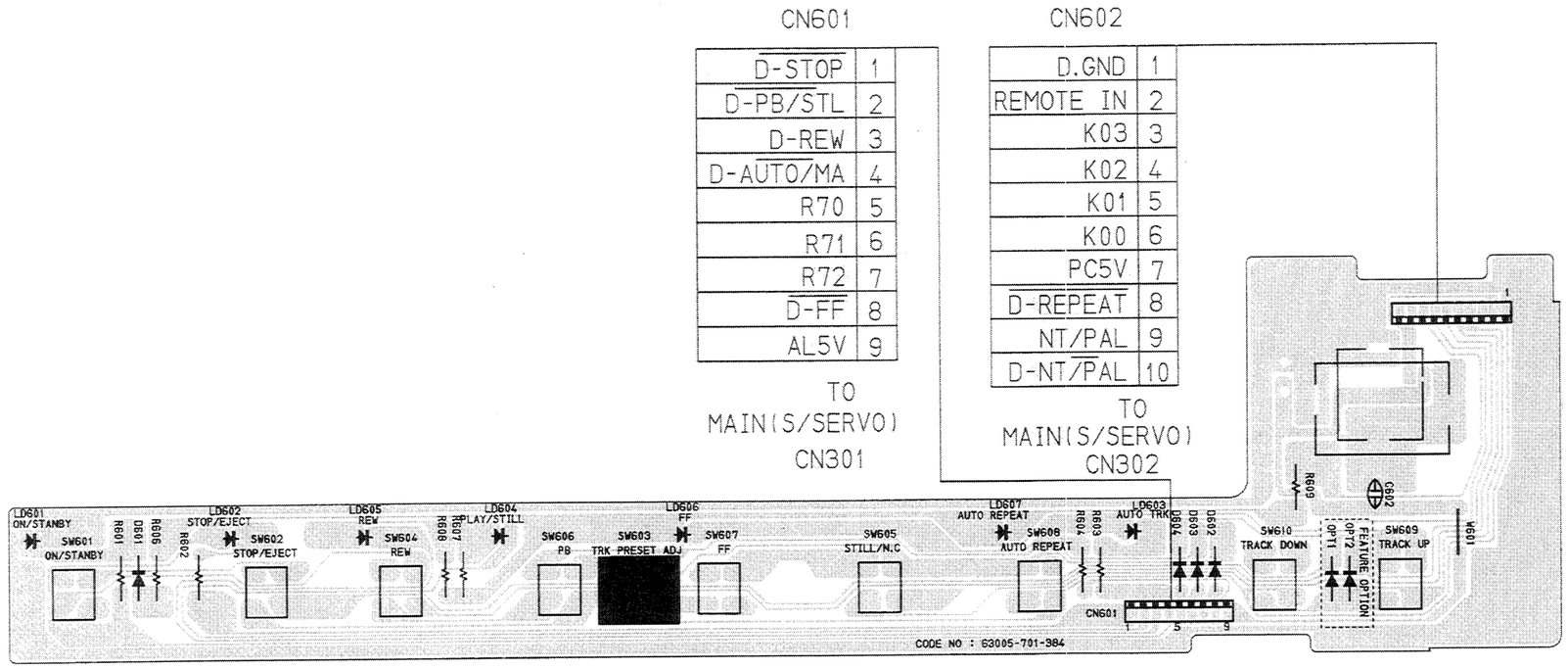
9-13. Function (PX-991/991R) (Top Side)



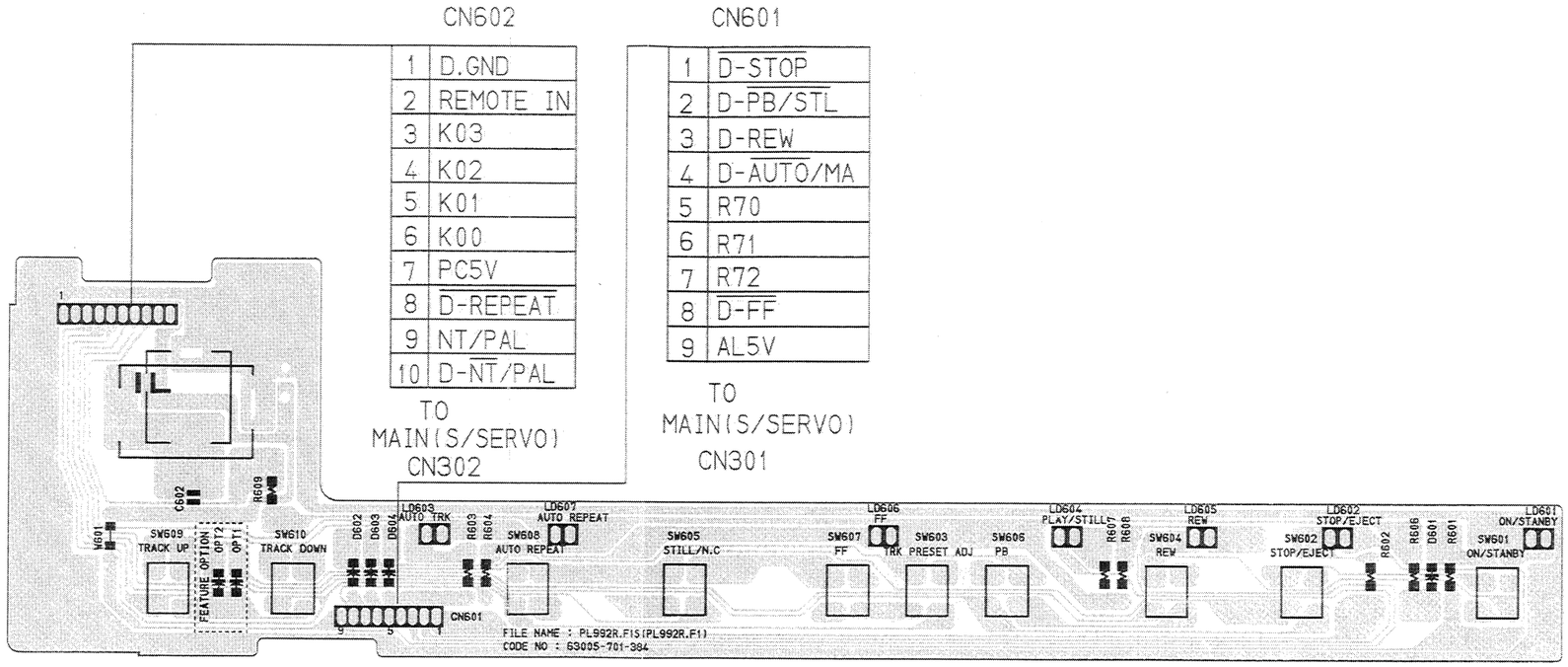
9-13. Function (PX-991/991R) (Bottom Side)



9-14. Function (PX-992/992R) (Top Side)

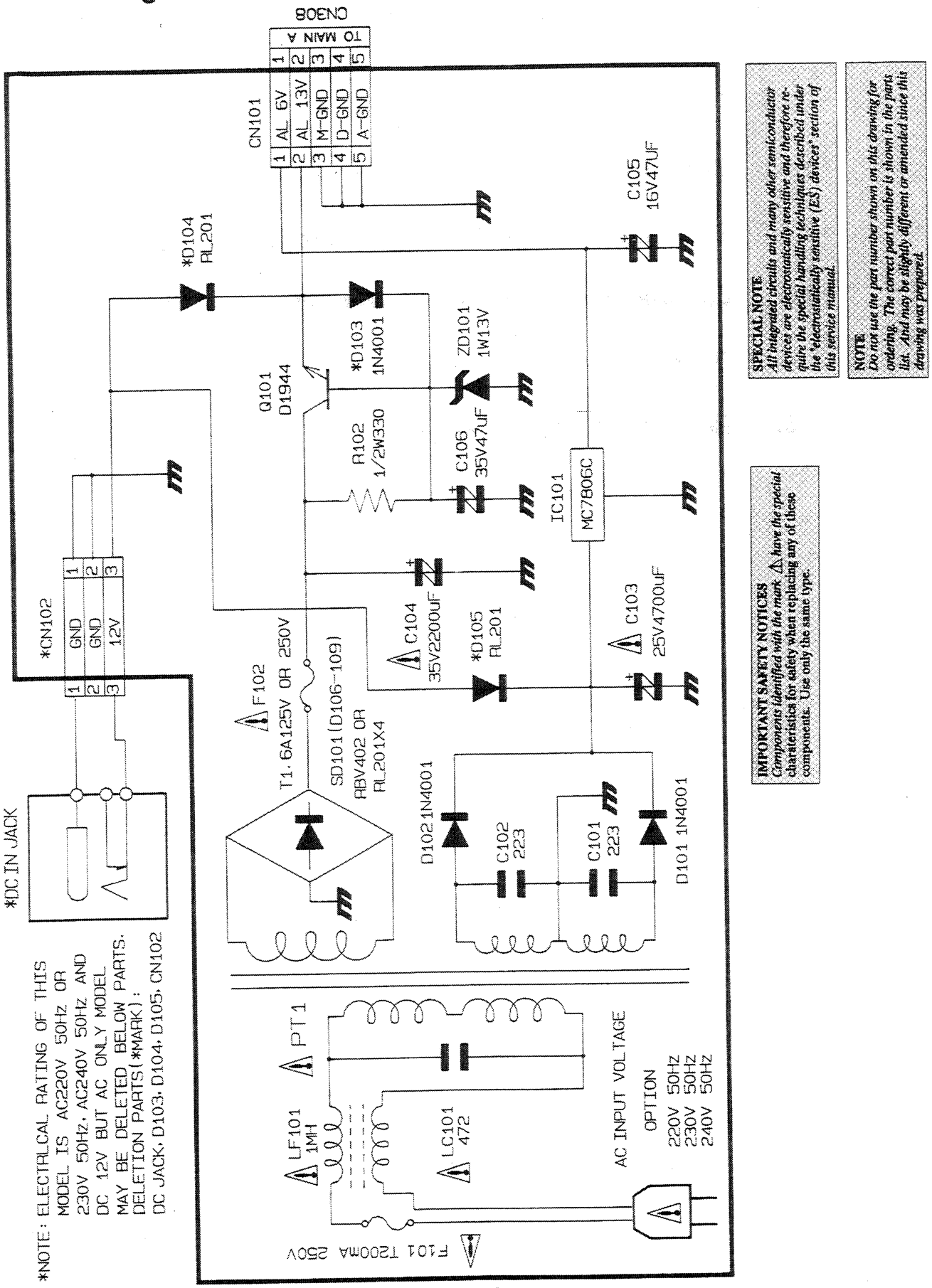


9-14. Function (PX-992/992R) (Bottom Side)



REGULATOR

10-1. Regulator



SPECIAL NOTE
All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "electrostatically sensitive (ES) devices" section of this service manual.

NOTE
Do not use the part number shown on this drawing for ordering. The correct part number is shown in the parts list. And may be slightly different or amended since this drawing was prepared.

IMPORTANT SAFETY NOTICES
Components identified with the mark ⚠ have the special characteristics for safety when replacing any of these components. Use only the same type.

10. SCHEMATIC DIAGRAMS

SYSCON / SERVO AUDIO / FUNCTION

FF : FAST FORWARD
FPS : FORWARD PICTURE SEARCH
RPS : REVERSE PICTURE SEARCH

IC301 (U83C51HB)

PIN	PLAY	STOP	REW	FF	EJECT	FPS	RPS
1	5.1	0.5	5.2	5.2	5.2	5.1	5.1
2	5.1	5.2	5.2	0.5	5.2	0.5	5.1
3	5.1	5.2	5.2	5.2	5.2	5.1	5.1
4	5.1	0	5.2	5.2	0	5.1	5.1
5	2.1	5.2	2.8	2.8	0	2.3	2.3
6	2.6	2.7	2.8	2.8	5.2	2.7	2.3
7	–	–	–	–	–	–	–
8	5.1	5.2	5.2	5.2	5.2	5.1	5.1
9	–	–	–	–	–	–	–
10	3.2	3.2	3.2	3.2	3.2	3.1	3.2
11	2.6	2.7	2.6	2.7	2.7	2.7	2.6
12	4.2	4.2	0	0	0	4.2	4.2
13	3.8	3.8	3.8	3.8	4.1	3.8	3.8
14	0	3.1	3.1	3.1	3.4	0	0
15	0	0	0	0	0	0	0
16	–	–	–	–	–	–	–
17	0	0	0	0	4.1	0	0
18	5.1	0	0	0	5.2	5.1	5.1
19	5.1	5.2	5.1	5.2	5.2	5.1	0
20	0	0	5.2	5.2	5.2	0	5.1
21	0	5.2	0	0	0	0	5.1
22	0	0.6	0.6	0.6	0.6	0.6	0.6
23	2.6	2.6	2.6	2.6	2.6	2.6	2.6
24	2.7	2.7	2.7	2.7	2.7	2.7	2.7
25	0	0	0	0	0	0	0
26	0	0	4.3	0	4.3	0	4.3
27	0	5.2	5.1	5.1	5.1	0	0
28	5.0	5.2	5.2	5.2	5.2	5.0	5.0
29	0	0	0	0	0	5.0	5.0
30	1.6	1.6	1.6	1.6	0	1.7	1.7
31	2.6	0	3.2	3.0	0	2.7	2.7
32	0	0	0	0	0	0	0

FF : FAST FORWARD
FPS : FORWARD PICTURE SEARCH
RPS : REVERSE PICTURE SEARCH

IC301 (U83C51HB)

PIN	PLAY	STOP	REW	FF	EJECT	FPS	RPS
33	–	–	–	–	–	–	–
34	5.0	5.1	5.1	5.1	5.1	5.0	5.0
35	3.1	5.2	3.0	3.0	0	2.7	3.1
36	5.0	5.1	5.1	5.1	5.2	5.0	5.0
37	0	0	0	0	0	0	0
38	4.4	4.4	4.4	4.4	0.6	4.4	4.4
39	4.7	4.7	4.7	4.7	0.6	4.7	4.7
40	0	0	0	0	4.6	0	0
41	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0
45	0.n	0.n	0.n	0.n	0.n	0.n	0.n
46	0.n	0.n	0.n	0.n	0.n	0.n	0.n
47	0.n	0.n	0.n	0.n	0.n	0.n	0.n
48	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0
50	–	–	–	–	–	–	–
51	0	0	0	0	0	0	0
52	5.0	5.2	5.2	5.2	5.2	5.0	5.0
53	0.8	0	0	0	0	0.8	0.8
54	1.2	1.2	1.2	1.2	1.2	1.2	1.2
55	1.6	1.6	1.6	1.6	1.6	1.6	1.6
56	–	–	–	–	–	–	–
57	–	–	–	–	–	–	–
58	–	–	–	–	–	–	–
59	0	0	0	0	0	0	0
60	–	–	–	–	–	–	–
61	2.6	0	2.4	2.1	2.4	2.4	2.2
62	0	0	0	0	3.7	0	0
63	0.5	5.2	5.2	5.2	5.2	0.5	0.5
64	5.1	5.2	0.5	5.2	5.2	5.1	0.5

FF : FAST FORWARD
FPS : FORWARD PICTURE SEARCH
RPS : REVERSE PICTURE SEARCH

IC302 (LM358S)

PIN	PLAY	STOP	REW	FF	FPS	RPS
1	5.1	5.2	5.2	5.2	5.1	5.1
2	2.3	2.3	2.3	2.3	2.3	2.3
3	2.3	2.3	2.3	2.3	2.3	2.3
4	2.3	2.3	2.3	2.3	2.3	2.3
5	0	0	0	0	0	0
6	2.3	2.3	2.3	2.3	2.3	2.3
7	2.3	2.3	2.3	2.3	2.3	2.3
8	2.3	2.3	2.3	2.3	2.3	2.3
9	5.1	5.2	5.2	5.2	5.1	5.1

FF : FAST FORWARD
FPS : FORWARD PICTURE SEARCH
RPS : REVERSE PICTURE SEARCH

IC303 (KS74HCLS132)

PIN	PLAY	STOP	REW	FF	FPS	RPS
1	5.1	5.2	5.2	5.2	5.2	5.1
2	1.3	1.3	1.3	1.3	1.3	1.3
3	1.9	5.2	1.9	1.9	2.4	2.1
4	5.1	5.2	5.2	5.2	5.1	5.1
5	1.3	1.4	1.3	1.3	1.3	1.3
6	2.8	2.8	2.8	2.8	2.8	2.4
7	0	0	0	0	0	0
8	2.1	5.2	2.8	2.8	2.3	2.3
9	5.1	5.2	5.2	5.2	5.1	5.1
10	1.3	1.3	1.3	1.3	1.3	1.3
11	–	–	–	–	–	–
12	–	–	–	–	–	–
13	–	–	–	–	–	–
14	5.1	5.2	5.2	5.2	5.1	5.1

FF : FAST FORWARD
FPS : FORWARD PICTURE SEARCH
RPS : REVERSE PICTURE SEARCH

IC304 (KA8301)

PIN	PLAY	STOP	REW	FF	FPS	RPS
1	0	0	0	0	0	0
2	0.5	0.5	0.5	0.5	0.5	0.5
3	0.9	0.9	0.9	0.9	0.9	0.9
4	0.9	0.9	12.1	12.1	0.9	0.9
5	2.3	2.3	2.3	2.3	2.3	2.3
6	2.3	2.3	2.3	2.3	2.3	2.3
7	11.9	12.8	12.2	12.3	11.7	11.5
8	11.9	12.8	12.2	12.3	11.7	11.5
9	0.9	0.9	0.9	0.9	0.9	0.9
10	0.5	0.5	0.5	0.5	0.5	0.5

FF : FAST FORWARD
FPS : FORWARD PICTURE SEARCH
RPS : REVERSE PICTURE SEARCH

MODE	PLAY			STOP			FF			REW			UNLOAD		
TR.NO	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C
Q301	0	0	5.7	0	0	5.8	0	0	5.8	0	0	5.8	0	0.9	5.8
Q302	5.0	5.0	5.7	5.1	5.1	5.8	5.1	5.8	5.1	5.1	5.8	5.1	5.1	5.8	5.1
Q303	0	5.7	0.1	0	3.1	0.1	0	3.1	0.1	0	3.1	0	0	3.1	0.1
Q304	5.0	5.7	5.0	0	0	5.1	0	0	5.1	0	0	5.1	0	0	5.1
Q305	0	0	3.7	0	0	3.6	0	0	3.6	0	0	3.6	0	0	3.7
Q306	0	4.2	0	0	4.2	0	0	0	12.7	0	0	12.7	0	0.5	12.9
Q307	12.7	12.7	0.9	13	13	0.9	2.8	2.8	12.7	12.8	2.8	12.7	12.9	13	12.9
Q308	0	0	5.8	0	5.1	0	0	5.1	0	0	5.1	0	0	5.1	0
Q309	5	5.8	5.1	0	0	5.2	0	0	5.2	0.3	0	5.2	0	0	5.2
Q310	0.3	0.9	3	0.3	0.9	3	0.3	0.9	3	0.3	0.9	3	0.3	0.9	3
Q311	0.7	1.2	3	0.7	1.4	2.6	0.7	1.4	2.6	0.7	1.4	2.6	0.7	1.4	2.6
Q312	0	4.7	0	0	4.8	0	0	4.8	0	0	4.8	0	0	4.8	0

FF : FAST FORWARD

MODE	PLAY			STOP			FF			REW			UNLOAD		
TR.NO	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C
Q501	0	0	1.5	0	0	2.4	0	0	2	0	0	0	0	0.8	0
Q502	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Q503	0	0	0	0	0.6	0	0	0.6	0	0	0.6	0	0	0.6	0
Q504	0	0	0	0	0.6	0	0	0.6	0	0	0.6	0	0	0.6	0
Q506	0	3.3	0	0	3.3	0	0	3.3	0	0	3.3	5.9	0	3.3	0

FF : FAST FORWARD
FPS : FORWARD PICTURE SEARCH
RPS : REVERSE PICTURE SEARCH

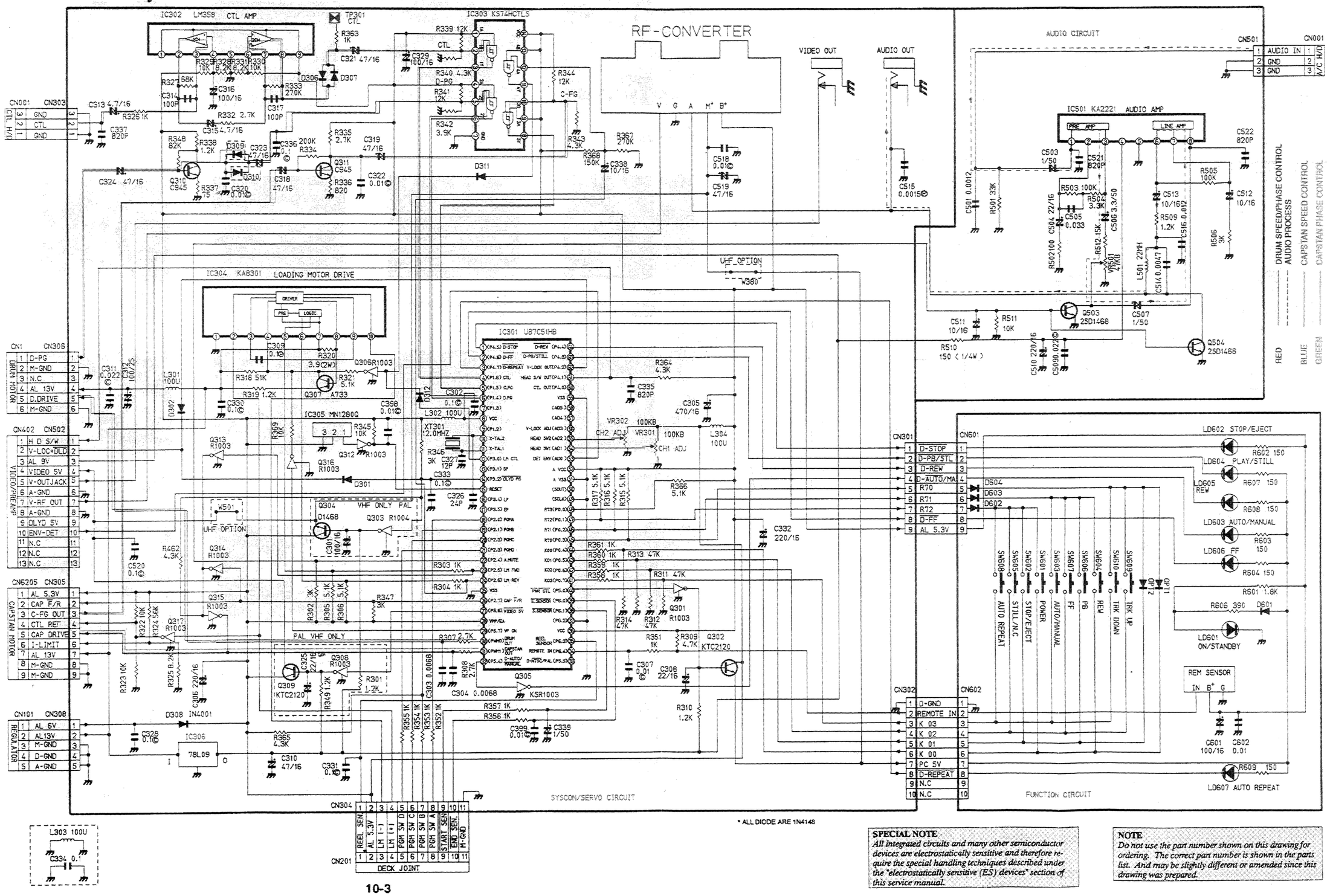
IC501 (KA2221)

PIN	PLAY	STOP	REW	FF	FPS	RPS
1	1.3	1.3	1.3	1.3	1.3	1.3
2	0.7	0.7	0.7	0.7	0.7	0.7
3	2.2	2.2	2.2	2.2	2.2	2.2
4	8.2	8.2	8.2	8.2	8.2	8.2
5	0	0	0	0	0	0
6	2.0	2.0	2.0	2.0	2.0	2.0
7	0.7	0.7	0.7	0.7	0.7	0.7
8	1.3	1.3	1.3	1.3	1.3	1.3

SYSCON / SERVO
AUDIO / FUNCTION

SYSCON / SERVO
AUDIO / FUNCTION

10-2. System Control/Servo/Audio/Function

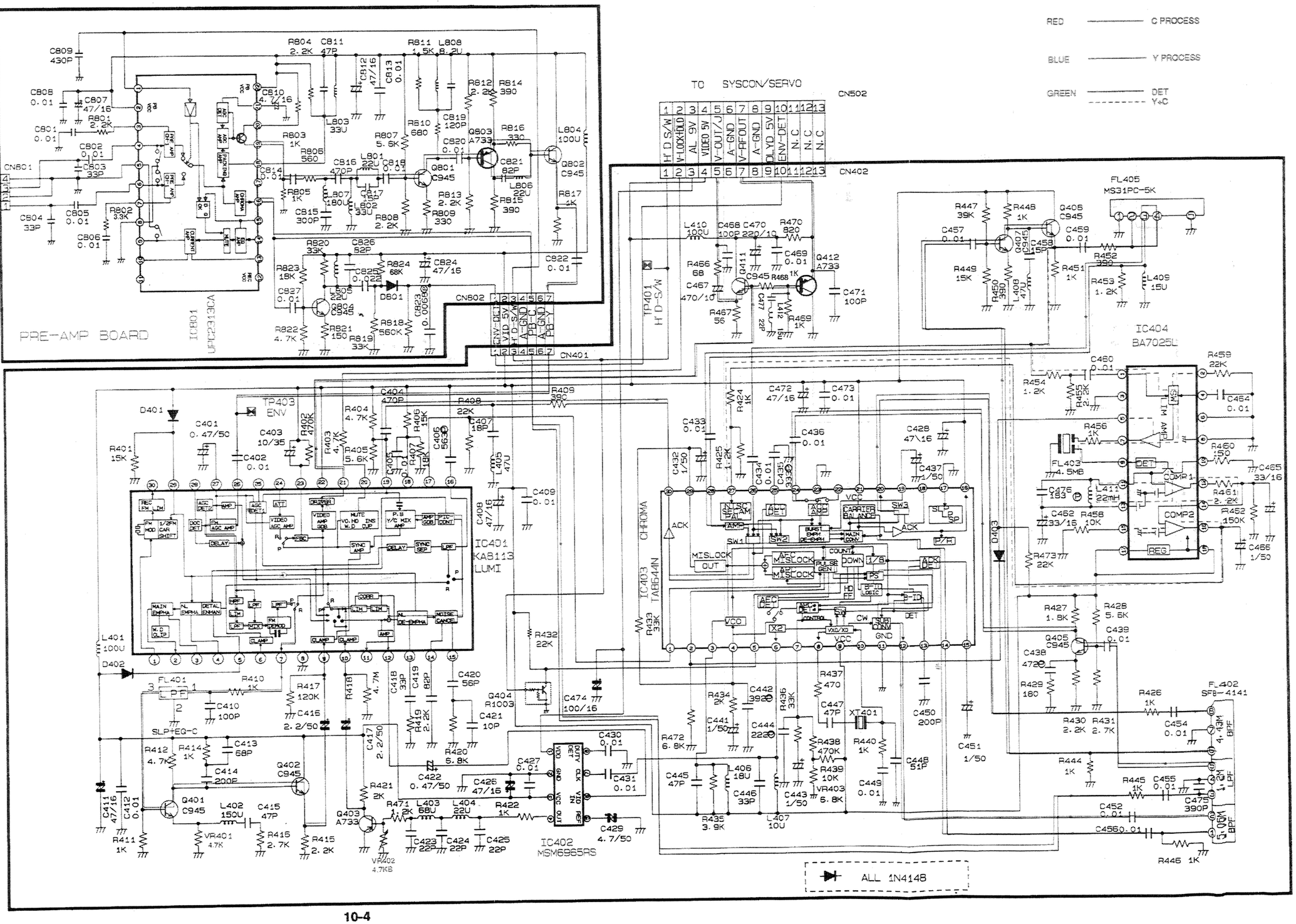


* ALL DIODE ARE 1N4148

SPECIAL NOTE
All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "electrostatically sensitive (ES) devices" section of this service manual.

NOTE
Do not use the part number shown on this drawing for ordering. The correct part number is shown in the parts list. And may be slightly different or amended since this drawing was prepared.

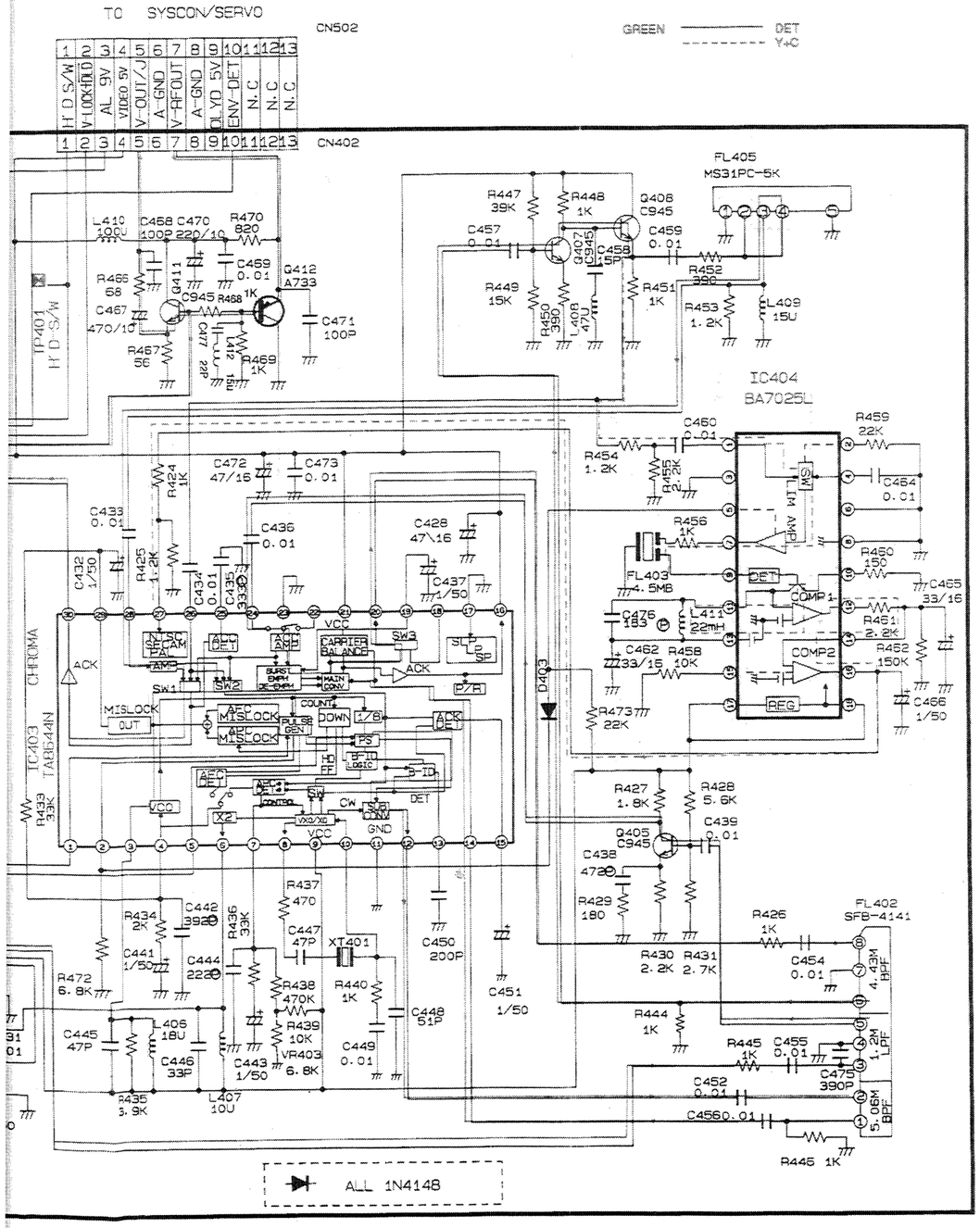
10-3. Luminance/Chrominance/Pre-Amp



RED ——— C PROCESS

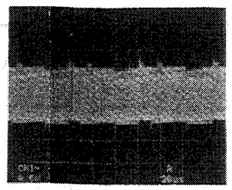
BLUE ——— Y PROCESS

GREEN ——— DET
- - - - - - - - Y+C

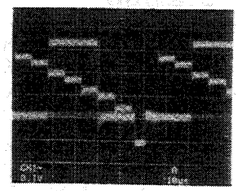


NOTE
Do not use the part number shown on this drawing for ordering. The correct part number is shown in the parts list. And may be slightly different or amended since this drawing was prepared.

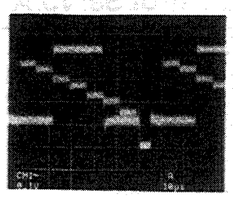
SPECIAL NOTE
All integrated circuits and many other semiconductor devices are electrostatically sensitive and therefore require the special handling techniques described under the "electrostatically sensitive (ES) devices" section of this service manual.



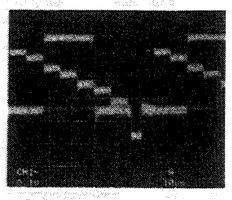
IC401-7
DE MOD WAVE
500mV/20us



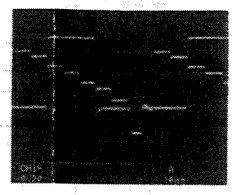
IC401-9
DE-EMPHA WAVE
100mV/10us



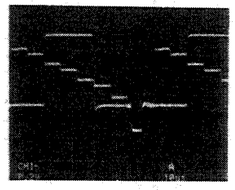
IC401-10
1H DELAYED IN
100mV/10us



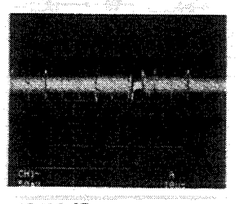
IC401-12
CCD
100mV/10us



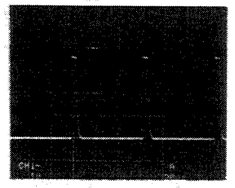
IC401-13
NL DE-EMPHA WAVE
200mV/10us



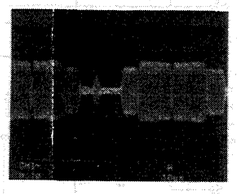
IC401-14
NOISE CANCEL WAVE
200mV/10us



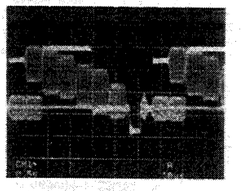
IC401-15
SYNC LPF
50mV/10us



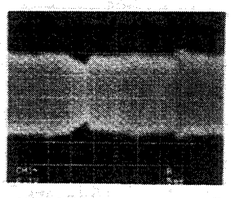
IC401-17
C-SYNC
1V/20us



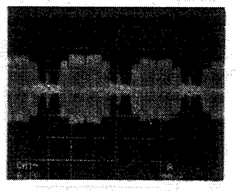
IC401-19
COLOR MAX IN
100mV/10us



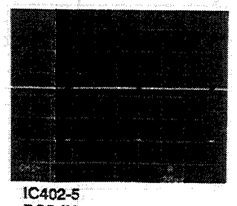
IC401-21
C-VIDEO WAVE
500mV/10us



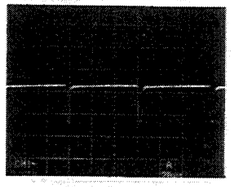
IC401-26
FM IN
100mV/5ms



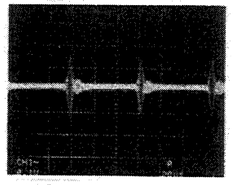
IC402-1
DET COLOR IN
100mV/20us



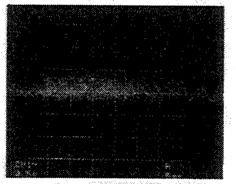
IC402-5
BGP IN
1V/20us



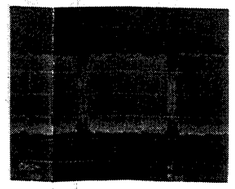
IC402-7
BURST GATE COLOR
1V/20us



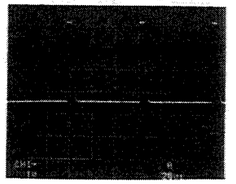
IC402-9
1/2fH COLOR WAVE
100mV/20us



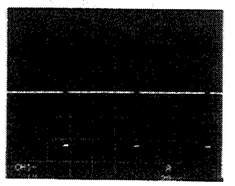
IC402-11 (PAL)
1/2fH AMP WAVE
500mV/5ms



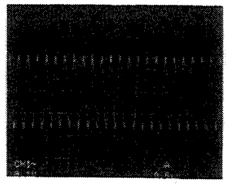
IC402-11 (MESECAM)
1/2fH AMP WAVE
1V/5ms



IC403-1
C-SYNC IN
1V/20us

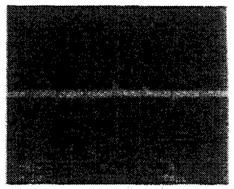


IC403-2
BGP OUT
1V/20us

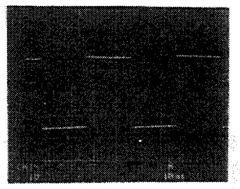


IC403-3
fsc
100mV/0.5us

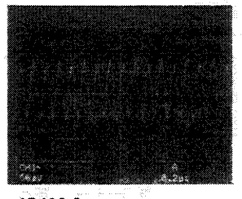
LUMINANCE/ CHROMINANCE



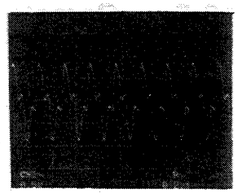
IC403-4
VCO FEEDBACK FILTER
100mV/50us



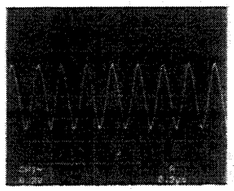
IC403-5
H'd S/W
1V/10us



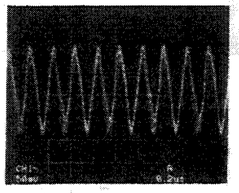
IC403-6
2fsc
50mV/0.2us



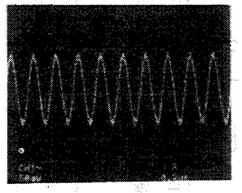
IC403-8
VXO IN
500mV/0.2us



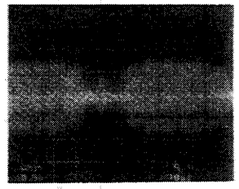
IC403-10
VXO OUT
200mV/0.2us



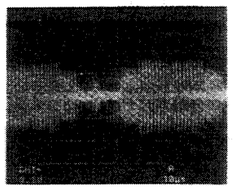
IC403-12
SUB CONN OUT
50mV/0.2us



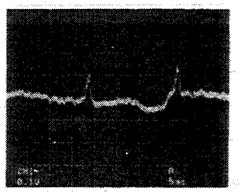
IC403-14
5.06MHz IN
50mV/0.2us



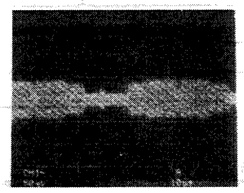
IC403-20
MIC OUT
500mV/10us



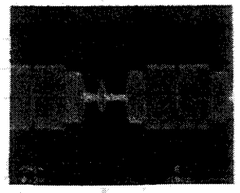
IC403-24
COLOR IN
100mV/10us



IC403-25
ACC DET FILTER
100mV/5ms



IC403-28
COMB FILTER OUT
50mV/10us



IC403-30
COLOR OUT
200mV/10us

A : ANALOG CHACK
D : DIGITAL CHACK

FWD.S : FORWARD SEARCH
REV.S : REVERSE SEARCH
JET FWD.S : JET FORWARD SEARCH
JET REV.S : JET REVERSE SEARCH

MODE	PLAY			FWD. S			REV. S			JET FWD. S			JET REV. S			STILL			A/D
T. P. LOCAT	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E	B	C	E
Q401	0.3	0.3	0.5	0.3	0.3	0.5	0.3	0.3	0.5	0.3	0.3	0.5	0.3	0.3	0.5	0.3	0.3	0.5	A
Q402	0.5	0.5	4.8	0.5	0.5	4.8	0.5	0.5	4.8	0.5	0.5	4.8	0.5	0.5	4.8	0.5	0.5	4.8	A
Q403	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0	A
Q404	0.0	4.0	3.0	0.0	4.0	3.0	0.0	4.0	3.0	0.0	4.0	3.0	0.0	4.0	3.0	0.0	4.0	3.0	A
Q405	0.1	0.1	0.6	0.1	0.1	0.6	0.1	0.1	0.6	0.1	0.1	0.6	0.1	0.1	0.6	0.1	0.1	0.6	A
Q407	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5	A
Q408	0.5	0.5	4.8	0.5	0.5	4.8	0.5	0.5	4.8	0.5	0.5	4.8	0.5	0.5	4.8	0.5	0.5	4.8	A
Q411	2.0	2.0	4.8	2.0	2.0	4.8	2.0	2.0	4.8	2.0	2.0	4.8	2.0	2.0	4.8	2.0	2.0	4.8	A
Q412	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	A
Q801	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.4	A
Q802	0.4	0.4	4.8	0.4	0.4	4.8	0.4	0.4	4.8	0.4	0.4	4.8	0.4	0.4	4.8	0.4	0.4	4.8	A
Q803	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	A
Q804	0.2	0.2	0.0	0.2	0.2	0.0	0.2	0.2	0.0	0.2	0.2	0.0	0.2	0.2	0.0	0.2	0.2	0.0	A

PRE-AMP

A : ANALOG CHACK
D : DIGITAL CHACK

FWD.S : FORWARD SEARCH
REV.S : REVERSE SEARCH
JET FWD.S : JET FORWARD SEARCH
JET REV.S : JET REVERSE SEARCH

IC 401(LA7323)

PIN NO	PLAY	STOP	FF	REW	FWD. S	REV. S	JET FWD. S	JET REV. S	STILL
1	–	–	–	–	–	–	–	–	–
2	–	–	–	–	–	–	–	–	–
3	–	–	–	–	–	–	–	–	–
4	–	–	–	–	–	–	–	–	–
5	4.0	–	–	–	4.0	4.0	4.0	4.0	4.0
6	–	–	–	–	–	–	–	–	–
7	1.2	–	–	–	1.2	1.2	1.2	1.2	1.2
8	–	–	–	–	–	–	–	–	–
9	0.48	–	–	–	0.48	0.48	0.48	0.48	0.48
10	0.48	–	–	–	0.48	0.48	0.48	0.48	0.48
11	–	–	–	–	–	–	–	–	–
12	0.48	–	–	–	0.48	0.48	0.48	0.48	0.48
13	0.90	–	–	–	0.90	0.90	0.90	0.90	0.90
14	0.90	–	–	–	0.90	0.90	0.90	0.90	0.90
15	3.40	–	–	–	3.40	3.40	3.40	3.40	3.40
16	3.0	–	–	–	3.0	3.0	3.0	3.0	3.0
17	3.6	–	–	–	3.6	3.6	3.6	3.6	3.6
18	2.2	–	–	–	2.2	2.2	2.2	2.2	2.2
19	0.22	–	–	–	0.22	0.22	0.22	0.22	0.22
20	4.0	–	–	–	4.0	4.0	4.0	4.0	4.0
21	2.00	–	–	–	2.00	2.00	2.00	2.00	2.00
22	4.88	–	–	–	4.88	4.88	4.88	4.88	4.88
23	3.60	–	–	–	3.60	3.60	3.60	3.60	3.60
24	3.00	–	–	–	3.00	3.00	3.00	3.00	3.00
25	0.4	–	–	–	0.4	0.4	0.4	0.4	0.4
26	1.4	–	–	–	1.4	1.4	1.4	1.4	1.4
27	0.00	–	–	–	0.00	0.00	0.00	0.00	0.00
28	0.00	–	–	–	0.00	0.00	0.00	0.00	0.00
29	3.9	–	–	–	3.9	3.9	3.9	3.9	3.9
30	3.6	–	–	–	3.6	3.6	3.6	3.6	3.6

A : ANALOG CHACK
D : DIGITAL CHACK

FWD.S : FORWARD SEARCH
REV.S : REVERSE SEARCH
JET FWD.S : JET FORWARD SEARCH
JET REV.S : JET REVERSE SEARCH

IC 402(MSM6965RS)

PIN NO	PLAY	STOP	FF	REW	FWD. S	REV. S	JET FWD. S	JET REV. S	STILL
1	9.2	–	–	–	9.2	9.2	9.2	9.2	9.2
2	0.00	–	–	–	0.00	0.00	0.00	0.00	0.00
3	4.8	–	–	–	4.8	4.8	4.8	4.8	4.8
4	1.4	–	–	–	1.4	1.4	1.4	1.4	1.4
5	3.4	–	–	–	3.4	3.4	3.4	3.4	3.4
6	0.5	–	–	–	0.5	0.5	0.5	0.5	0.5
7	0.12	–	–	–	0.12	0.12	0.12	0.12	0.12
8	5.4	–	–	–	5.4	5.4	5.4	5.4	5.4

A : ANALOG CHACK
D : DIGITAL CHACK

FWD.S : FORWARD SEARCH
REV.S : REVERSE SEARCH
JET FWD.S : JET FORWARD SEARCH
JET REV.S : JET REVERSE SEARCH

IC B01(UPC2313CA OR KA8102)

PIN NO	PLAY	STOP	FF	REW	FWD. S	REV. S	JET FWD. S	JET REV. S	STILL
1	4.2	–	–	–	4.2	4.2	4.2	4.2	4.2
2	4.8	–	–	–	4.8	4.8	4.8	4.8	4.8
3	2.0	–	–	–	2.0	2.0	2.0	2.0	2.0
4	0.64	–	–	–	0.64	0.64	0.64	0.64	0.64
5	0	–	–	–	0	0	0	0	0
6	0.64	–	–	–	0.64	0.64	0.64	0.64	0.64
7	2.0	–	–	–	2.0	2.0	2.0	2.0	2.0
8	0	–	–	–	0	0	0	0	0
9	–	–	–	–	–	–	–	–	–
10	–	–	–	–	–	–	–	–	–
11	–	–	–	–	–	–	–	–	–
12	–	–	–	–	–	–	–	–	–
13	–	–	–	–	–	–	–	–	–
14	–	–	–	–	–	–	–	–	–
15	–	–	–	–	–	–	–	–	–
16	0.2	–	–	–	0.2	0.2	0.2	0.2	0.2
17	–	–	–	–	–	–	–	–	–
18	4.8	–	–	–	4.8	4.8	4.8	4.8	4.8
19	0.4	–	–	–	0.4	0.4	0.4	0.4	0.4
20	0.6	–	–	–	0.6	0.6	4.5	0.6	0.6
21	0.7	–	–	–	0.7	0.7	0.7	0.7	0.7
22	4.5	–	–	–	4.5	4.5	4.5	4.5	4.5

LUMINANCE/ CHROMINANCE

A : ANALOG CHACK
D : DIGITAL CHACK

FWD.S : FORWARD SEARCH
REV.S : REVERSE SEARCH
JET FWD.S : JET FORWARD SEARCH
JET REV.S : JET REVERSE SEARCH

IC 403(TA8644N)

PIN NO	PLAY	STOP	FF	REW	FWD. S	REV. S	JET FWD. S	JET REV. S	STILL
1	3.7	–	–	–	3.7	3.7	3.7	3.7	3.7
2	2.5	–	–	–	2.5	2.5	2.5	2.5	2.5
3	0.26	–	–	–	0.26	0.26	0.26	0.26	0.26
4	2.2	–	–	–	2.2	2.2	2.2	2.2	2.2
5	0.12	–	–	–	0.12	0.12	0.12	0.12	0.12
6	0.12	–	–	–	0.12	0.12	0.12	0.12	0.12
7	1.6	–	–	–	1.6	1.6	1.6	1.6	1.6
8	1.7	–	–	–	1.7	1.7	1.7	1.7	1.7
9	4.5	–	–	–	4.5	4.5	4.5	4.5	4.5
10	0.54	–	–	–	0.54	0.54	0.54	0.54	0.54
11	0.0	–	–	–	0.0	0.0	0.0	0.0	0.0
12	0.2	–	–	–	0.2	0.2	0.2	0.2	0.2
13	2.6	–	–	–	2.6	2.6	2.6	2.6	2.6
14	0.15	–	–	–	0.15	0.15	0.15	0.15	0.15
15	3.2	–	–	–	3.2	3.2	3.2	3.2	3.2
16	4.80	–	–	–	4.80	4.80	4.80	4.80	4.80
17	0.0	–	–	–	0.0	0.0	0.0	0.0	0.0
18	2.1	–	–	–	2.1	2.1	2.1	2.1	2.1
19	2.6	–	–	–	2.6	2.6	2.6	2.6	2.6
20	1.8	–	–	–	1.8	1.8	1.8	1.8	1.8
21	4.8	–	–	–	4.8	4.8	4.8	4.8	4.8
22	1.6	–	–	–	1.6	1.6	1.6	1.6	1.6
23	0.0	–	–	–	0.0	0.0	0.0	0.0	0.0
24	0.34	–	–	–	0.34	0.34	0.34	0.34	0.34
25	3.2	–	–	–	3.2	3.2	3.2	3.2	3.2
26	0.50	–	–	–	0.50	0.50	0.50	0.50	0.50
27	0.0	–	–	–	0.0	0.0	0.0	0.0	0.0
28	2.30	–	–	–	2.30	2.30	2.30	2.30	2.30
29	2.30	–	–	–	2.30	2.30	2.30	2.30	2.30
30	0.48	–	–	–	0.48	0.48	0.48	0.48	0.48

A : ANALOG CHACK
D : DIGITAL CHACK

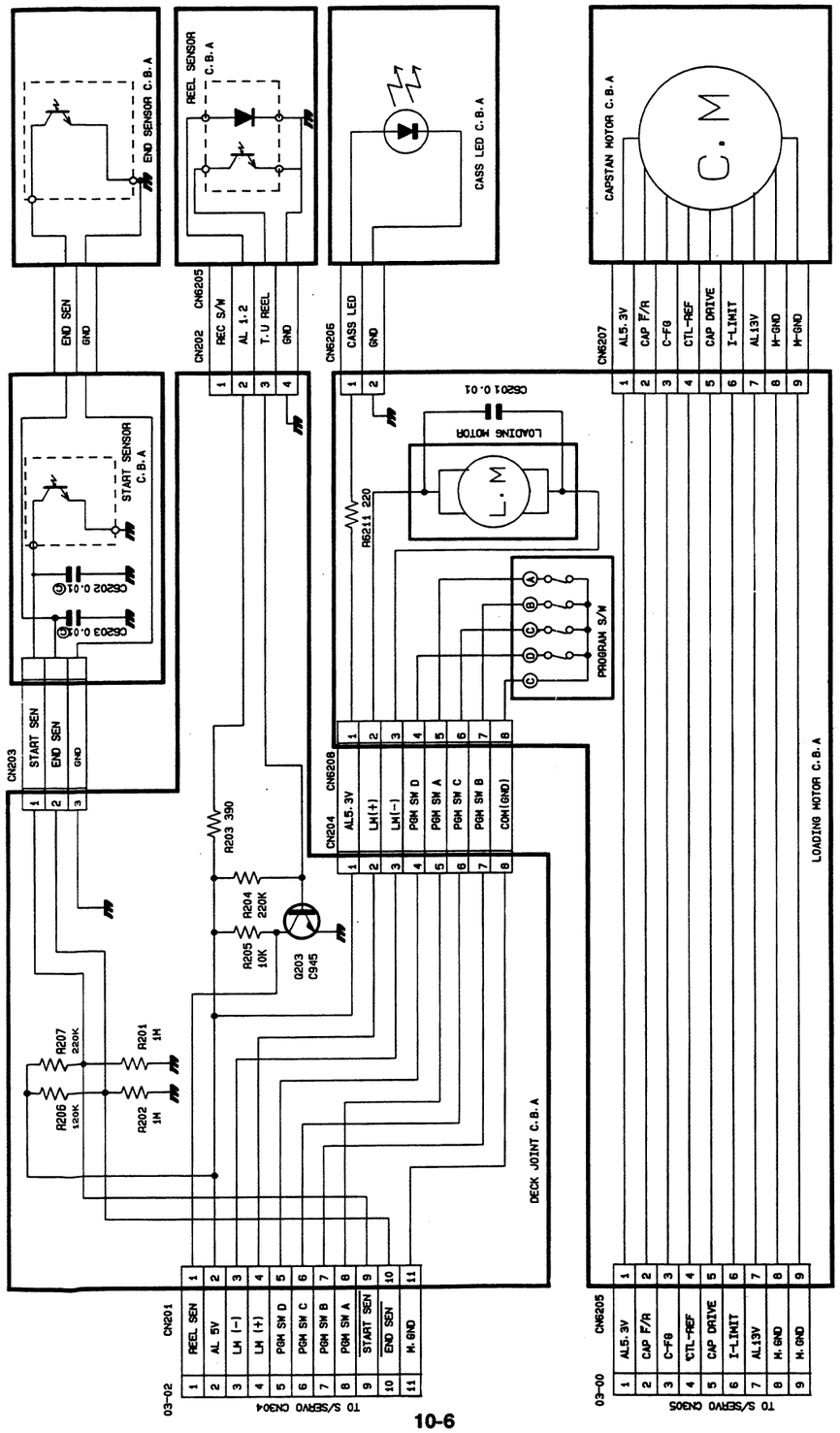
FWD.S : FORWARD SEARCH
REV.S : REVERSE SEARCH
JET FWD.S : JET FORWARD SEARCH
JET REV.S : JET REVERSE SEARCH

IC 404(BA7025L)

PIN NO	PLAY [PAL.]	PLAY [MESECAM]	FWD. S PAL.	FWD. S MESEC	REV. S PAL.	REV. S MESEC	JET FWD. S PAL.	JET FWD. S MESEC	JET REV. S PAL.	JET REV. S MESEC	STILL PAL.	STILL MESEC
1	0.28	0.20	0.28	0.20	0.28	0.20	0.28	0.20	0.28	0.20	0.28	0.20
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
6	0	0	0	0	0	0	0	0	0	0	0	0
7	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4
10	0.3	0.55	0.3	0.55	0.3	0.55	0.3	0.55	0.3	0.55	0.3	0.55
11	0.20	4.0	0.20	4.0	0.20	4.0	0.20	4.0	0.20	4.0	0.20	4.0
12	0	3.6	0	3.6	0	3.6	0	3.6	0	3.6	0	3.6
13	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.0	3.3	3.0
14	0	3.5	0	3.5	0	3.5	0	3.5	0	3.5	0	3.5
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	3.5	0	3.5	0	3.5	0	3.5	0	3.5	0	3.5
17	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8
18	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8

DECK JOINT

10-4. Deck Joint



REMOTE CONTROL

10-5. Remote Control